TRANSFORMATION TOWARD AN ECOLOGICAL CIVILIZATION:

A RELATIONAL APPROACH TO A JUST TRANSITION

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In Partial Fulfillment

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by

Zack Walsh

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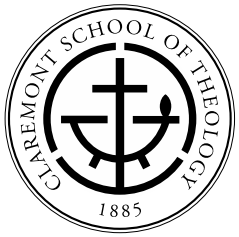

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Abstract

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Zack Walsh

Civilization is at a precipice. After decades of overshoot, societies are entering a period of protracted breakdown and collapse. This moment is unlike prior cycles in civilizational history. For the first time, the planet is now primarily shaped by human activity, and humanity's survival and flourishing are not assured. Civilization, if it survives, must intentionally limit its development to stay within safe social and ecological boundaries— something that is without historical precedent. This calls for a shift toward an Ecological Civilization—a society organized by principles of justice and regeneration. This dissertation explores this transition through multiple lenses—personal, social, and ecological—and argues that fundamentally re-structuring society on the basis of a relational paradigm offers the best pathways toward an Ecological Civilization. Theoretical and practical examples are explored in equal measure to provide a more coherent and comprehensive account of the depth and breadth of the transition under consideration. Cross-cutting discussions of spirituality, science, education, and political economy (among many other fields) offer insights into the multifaceted nature of today's global poly-crisis, its challenges, and its opportunities. The dissertation concludes by outlining feasible pathways for realizing a just transition to an Ecological Civilization.

Key words: Great Transition, Anthropocene, Sustainability, Systems change, Systems thinking, Relationality, Eco-justice, Postcapitalism, Commons, Process philosophy

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Introduction

i. A Crisis of Civilization: Breakdown or Breakthrough?

Life as we know it is changing rapidly and dramatically. Human activity is destabilizing the Earth system as a whole, breeching the parameters of what constituted a safe operating space for humanity over the last 10,000 years (Rockström et al., 2009). The International Commission on Stratigraphy (ICS), the body charged with formally marking geological time, is currently deliberating on whether we have entered a new geological epoch, called the Anthropocene, in which human activity is the primary driver of planetary change.

The Anthropocene, literally translated as the "human epoch," has been a hotly contested term. Some argue that it constructively reframes the human predicament in relationship to the Earth by de-centering the human and re-embedding humanity within the web of life. Others argue that by naming the current geological epoch after ourselves, we continue a long-standing tradition of anthropocentrism that privileges human supremacy and control. The danger of adopting the Anthropocene as a concept is that it risks either characterizing the problem as a species-wide defect, or it invites humanity to identify itself even more hubristically as a driver of change.

By ascribing the responsibility for our environmental ails to the human species as a whole, the term also ignores that human actions are collectively but unequally shaping the state of the Earth system (Crutzen, 2002; Steffen et al., 2007; Steffen et al., 2011). Humanity's influence over planetary systems must be socially and historically situated. Anthropogenic climate change does not emerge because of humanity *sui generis*; it emerges because of the outsized impact of

some peoples and cultures (white, Euro-Americans) and particular socio-historical conditions and systems (capitalism, colonialism, and imperialism).

Although formal acceptance of the concept will take a long time, the Anthropocene is already widely used by scholars and the Anthropocene Working Group (AWG), which consults the ICS, has already agreed to adopt the concept (Subcommission on Quaternary Stratigraphy, 2019). Most ongoing debate does not challenge the concept's validity, but questions how and when we should mark the start date for the Anthropocene, as marking the start date has political consequences— it publicly communicates who or what is responsible for current environmental problems.

The dominant hypothesis is that the Anthropocene began around 1950 when humanity's increased technological capabilities, following the advent of the atomic bomb and the globalization of the post-war economy, contributed to a "Great Acceleration" of human activities' environmental impact. The other dominant hypothesis is that the Anthropocene began in the Industrial Age following the advent of the steam engine around the year 1800 when there is a measurable departure from the stable dynamic between human activity and earth systems (Steffen et al., 2011).

A third, related hypothesis is that the ascendence of capitalism in the early modern period and its continued impact today constitutes the preeminent factor explaining our planetary-scale impact on the environment. Environmental historian Jason W. Moore (2016) proposes that we call our current epoch the Capitalocene, or the "age of capitalism." Contextualizing the crisis in this way serves to politicize it. Given the inextricable link between capitalism and climate

change, the central task facing humanity arguably becomes the search for a sustainable alternative to our global political economy: systems change, not climate change (Klein, 2014).

In all cases, we have entered a new climate regime which poses a threat to civilization, and whether we reorganize and redesign social systems to support planetary flourishing will determine whether we sustain a life worth living. Most of us are aware that modern civilization has become deeply unsustainable, but many do not realize that we are heading toward civilizational collapse. Today's civilization is increasingly complex, while social inequalities are deepening, our environmental impact is growing, and the climate is changing. When all four of these indicators rise together, the likelihood of collapse is greater (Kemp, 2019).

The potential collapse of modern civilization marks a decisive moment in human history. On average civilizations have lasted about 336 years (Kemp, 2019). Whereas prior collapses were localized to specific geographic regions and bounded in time, today's civilization is globally interconnected, and the ramification of its collapse has existential consequences for all life on earth and human history writ large.

The explosive growth of modern civilization was a historical event predicated on the exploitation of cheap energy reserves buried beneath the Earth's surface. Now, the population and complexity of society has grown beyond society's capacity to sustain it via the continued use of fossil fuels. Unless we transition to a sustainable civilization, breakdown will accelerate and we will have reached the peak of civilization's development, as harnessing the concentrated energetic potential of planetary history can only happen once.

What we face is a turning point between two futures: The Great Unraveling and the Great Transition (Lavelle & Walsh, 2019). Present-day responses to eco-crisis are split between these two futures characterized by breakdown versus breakthrough. The next decade constitutes what systems theorists call a "decision window." As social and ecological pressures mount, societies must re-organize themselves or else they face catastrophic collapses as Earth systems irreversibly change (Laszlo, 2012). After 2°C of warming, we begin to reach a Hothouse Earth scenario in which irreversible tipping points (e.g., methane gas release from melting permafrost, melting polar ice packs, forest dieback and desertification) not only permanently destabilize our climate, but also our political and economic systems. Social systems will either be transformed by choice or else they will collapse under their own weight, unable to manage the forthcoming crises as sustaining them becomes too costly. Current systems simply cannot address the magnitude of today's challenges, and the transition to a new world is inevitable. Change is coming one way or another. It will either be a just or unjust transition.

Scientists predict there is only a 5% chance of limiting warming below 2°C, and a 1% chance of limiting it below 1.5°C by 2100 (Raftery et al., 2017). Even if national governments succeed in achieving their current commitments to the 2015 Paris Agreement, UNEP estimates that we will still experience planetary warming of about 3.4°C by 2100. The best current estimate gives a likely [66% confidence interval] range of between 2.6°C and 3.9°C of warming (Sherwood et al, 2020). Taking climate tipping points into account, the resulting warming could be as high as 5°C by 2100. Scientists say that 4°C of warming is incompatible with an organized global community and is likely to be beyond adaptation (Dunlop and Spratt, 2017, p. 5).

Under the Great Unraveling scenario, the ensuing collapse of socio-ecological systems would be utterly devastating. Some of us would survive, but we would live in a world beset by social breakdown and conflict in which deeply unequal societies compete for resources. Over the next few decades, we can expect to face drought-triggered agricultural failures, water-security issues, social unrest, and conflict. By 2050, the International Organization for Migration estimates there will be an exodus of about 200 million climate refugees (Brown, 2008). The UK government predicts that we will experience the collapse of part or all of the Amazonian rainforest, a 25-60% increase in the risk of hunger, and more than a billion people without sufficient water (Stern, 2006).

Although the Great Unraveling and Great Transition are typically considered future scenarios, one does not have to look far to find indications that both are already happening. It is becoming evident that global crises are more pronounced and sustained. The COVID pandemic, police brutality, climate disasters, protests and political unrest have been frontpage news for nearly two years. Indigenous people, for example, have experienced the apocalypse (Coleman, 2017) and indigenous knowledge has been warning us about climate change for centuries (Harris, 2019). "The future is already here," as William Gibson once said, "It's just not very evenly distributed" (Quote Investigator, 2018).

The current political and economic landscape is undergoing structural transformations and capitalism is in terminal decline. As Robert Gordon (2017) illustrates in *The Rise and Fall of American Growth*, the growth of the global economy has steadily declined since 1970, and there are no prospects for rising levels of growth in the foreseeable future. Rapid economic growth was in fact a one-time-only event, spurred by technological revolutions between the mid-19th and

20th centuries. We are entering a period of secular stagnation. Capitalism's exploitative logics, which worked in an empty world, can no longer sustain themselves in a full world (Daly, 2009).

Over the same forty-year period that global growth rates declined, neoliberal policies enabled a massive redistribution of wealth, so that the political and economic elite gained most of the new wealth created, while driving down the wages and purchasing power of everyone else (Saez and Zucman, 2016). Between 1973-2013, there was a 74% increase in productivity while the average hourly compensation increased by only 9% (Mishel, Gould, and Bivens, 2015). According to Oxfam International (2017), the eight richest men now own half the world's wealth.

There is a greater sense of uncertainty and anxiety about the future given the diminishing prospects for long-term growth and widening levels of inequality. The trend toward stagnation in the 21st century and the ongoing decoupling of profits from improvements in the material economy means that capitalism will surely produce more inequality. If you're under the age of 40, the world you're going to grow into won't look anything like the one you grew up in. Millennials are the first generation to be worse off financially than their parents (Barr & Malik, 2017). The majority of younger Americans in Generation X and Millennials already believe that income inequality, national debt, environmental degradation, and political polarization will all rise, as the economy becomes weaker (Gramlich, 2019).

Inequality doesn't just appear without gross imbalances in political power. Levels of inequality have ebbed and flowed over the course of capitalism's history, depending in large part upon the degree to which the state intervened through market regulation, social welfare, and redistribution. In the last forty years, neoliberalism has sharply accelerated inequalities, because it has severely limited market regulation and privatized or defunded social welfare programs.

This has systematically reduced the power of government relative to the power of private corporations, especially transnational corporations. Corporations have accumulated so much wealth and political influence, they often exercise extra-judicial influence over sovereign governments, transforming governance by elites into rule by corporate oligarchs.

Naturally, there has concurrently been a steady erosion and growing distrust of political institutions. “In 1964, Americans agreed by 64% to 29% that government was run for the benefit of all the people. By 2012, the response had reversed, with voters saying by 79% to 19% that government was ‘run by a few big interests looking after themselves’” (Reich, 2015). The recent global rise of populism clearly constitutes a growing revolt against the political and economic elite.

People who accept the Great Unraveling as the only reality tend to embrace rugged individualism, tribalism, and protectionism. They see a dying system and respond reactively under stress. If we do not transition, societal breakdown will likely spur the rise of eco-fascism and embolden white supremacy, authoritarianism, and right-wing nationalism. The most statistically significant variable predicting whether a voter elected Donald Trump was authoritarianism (Macwilliams, 2016), and this is not surprising considering that many people turn to crisis cults during times of collapse. “Make America Great Again!” was Trump’s campaign slogan precisely because it spoke to the collective desire of his primary voting bloc, feeding illusions of recovered grandeur and empowerment.

Slavoj Žižek (2011) has suggested that capitalism will restructure itself in more authoritarian forms. The increasing popularity of the China model as a viable political response to the catastrophes of the 21st century support this view (Kurlantzick, 2013). Climate fiction

author, Margaret Atwood (2015), declares “there are two threats to our society that are even greater than the 2008 financial meltdown... environmental damage due to climate change, and the possible failure of China.” Evidently, China will substantially determine the world’s political and economic strategy (Summers, 2015), and it has already begun to lead the world’s climate negotiations and green investment strategy (Hilton, 2016). The Chinese government has indicated that it hopes to overtake the U.S. as the world leader of global trade and international security (Huang, 2017). American imperialism seems poised to compete with Chinese imperialism, as China’s increasingly aggressive military-backed foreign policy challenges the U.S., while protecting its foreign based investments across Asia, Africa, and Latin America (Hung, 2015; Krauss & Bradsher, 2015; Mingfu, 2015). China is now the world leader in renewable energy (Blackwell, 2016), green finance (Lehr, 2016), smart cities (Sellebraten, 2016), automation (Chu & Davis, 2015), peer-to-peer platforms (Netessine and Solodkiy, 2016) and central bank digital currencies (Areddy, 2021), clearly signaling its desire to shape the future. While it’s development of a nation-wide social credit system raises alarming concerns about human rights in an era of authoritarian capitalism (Hatton, 2015; Osborne, 2015; Yang, 2017).

For those unable to imagine a Great Transition, there is a strong desire to maintain any remaining sense of privilege or entitlement. However, if we remain attached to crumbling identities and worldviews, we will likely experience a Hobbesian struggle in which violence becomes the primary means for maintaining order amidst the ruins of conventional world systems. “We are seeing the beginnings of the era of climate barbarism,” writes Naomi Klein (Hanman, 2019). A growing number of “preppers” are building bunkers and stockpiling resources. The ultra-rich are buying $3 million apartments in underground missile silos to comfortably survive future catastrophes, as the rest of humanity suffers (Osnos, 2017). And the

U.S. and U.K. governments are resigned to mass-mobilizations of military to cope with a new normal beset by conflict and disaster (McKibben, 2010, pp. 82-85). Such a response protects the power and privilege of people who benefit from the collapsing system.

To decrease the likelihood of the Great Unraveling, we must envision feasible political and economic alternatives. Yet, current path dependencies disincentive action and constrain future possibilities, as dreams of what we'll do remain captive to the things we've already done. Mega-infrastructure projects like the "One Belt, One Road" create global trade corridors that invest in the upscaling of transnational commerce. China has poured more concrete in three years than the U.S. had in the entire 20th century, and the vast increase in zero interest rate policies (ZIRP) and quantitative easing (QE) has attempted to pull demand forward from the future (Stone, 2015). Visioning documents produced by corporations assume futures in which they not only exist but thrive over many decades (Low, 2015). Financial institutions, investment groups, insurance agencies, and asset managers are assessing the risks and opportunities to profit from climate change.

Most people depend on business-as-usual and fail to conceive its alternatives. As Mark Fisher (2009) wrote, it's easier to imagine the end of the world than the end of capitalism. The slogan, "There is No Alternative" (TINA), popularized by British Prime Minister Margaret Thatcher has implicitly shaped mainstream ideology, upholding neoliberalism as the only possible reality, and demotivating people from imagining a transformation in the political economy. Though the 2007/8 financial crisis questioned neoliberalism's legitimacy, capitalist realism has persisted, as if, Slavoj Žižek (1994) says, "liberal capitalism is the 'real' that will somehow survive even under conditions of a global ecological catastrophe" (p.1). Dominant

narratives in the mainstream media emphasize adapting to post-apocalyptic realities, as seen in films like *Mad Max*, *Snowpiercer*, and *The Day After Tomorrow*. The immense popularity of dystopian climate fiction is testament to the failure of popular narratives to imagine a Great Transition. “Even in fiction we are trapped within the limits of a specifically capitalist imaginary” (Storm, 2014).

Despite the public’s serious concern about the effects of climate change, it is difficult to conceive alternatives alongside the pressure to maintain livelihoods within the current system. Although an overwhelming majority (88%) of Americans support protecting the earth's environment, only 52% support enacting policies that entail specific economic costs, and only 18% said enacting legislation to address climate change should be their highest priority, below chiefly economic concerns like improving the job situation (58%), reducing the budget deficit (45%), and reducing health care costs (45%) (Piacenza, 2015). In another study from the Australian public, 54% of people said they believe our way of life will most likely end within the next 100 years and 24% said humans will most likely be wiped out. There is very little discussion of how an alternative political economy could feasibly provide for their needs and support the flourishing of the Earth’s systems at the same time (Randle & Eckersley, 2015).

Nevertheless, in the same survey, 75% responded actively, agreeing that “we need to transform our worldview and way of life if we are to create a better future for the world;” whereas 44% responded with nihilism and 33% with religious fundamentalism, viewing the end of the world as a battle between good and evil (Randle & Eckersley, 2015). Despite a large minority of people reverting to established views and behaviors in times of crisis, there does in fact exist an alternative will to work toward the Great Transition.

Another sign of hope is that people are increasingly recognizing that neoliberal capitalism is not universally accepted, and that globalization, in the singular, no longer covers our fractured and multi-temporal present. Neoliberalism has suffered a sustained legitimacy crisis since the 2007/8 financial crisis, and even conservative economic institutions like the IMF now question its legitimacy (Ostry, Loungani, & Furceri, 2016). For decades, people have become disillusioned with the myth of progress, and increasingly, they recognize the future as a cultural construct, more aptly characterized by a plurality of possible futures, as expressed in the World Social Forum's slogan: "Another World is Possible" (Williams, 2016).

Recognizing that the political economy is socially and culturally constructed, contingent on many economic and non-economic factors, is the first step toward transformation. Like all aspects of life, economics is the result of decisions, prevailing prejudices, and leaps of faith, and as Ha-Joon Chang (2010) demonstrates, neoliberalism is replete with its own myths and questionable dogmatic assumptions. Once people begin to look at the system on which they depend as somehow strange and alien, they create space for a much more objective, demystified view of the political economy, its contingencies, and the possibility of its alternatives. Ursula K. Le Guin (2014) said, "We live in capitalism, its power seems inescapable — but then, so did the divine right of kings. Any human power can be resisted and changed by human beings."

People who respond proactively, offering pathways for transitioning toward a just and sustainable society are laying the groundwork for the Great Transition. The Great Transition describes a future in which society is comprehensively reorganized to sustain itself in dynamic equilibrium with the Earth's systems. Humans have never before sustainably organized a global society at such a high level of complexity, but for the first time in history it may be possible to

live in a globally interconnected, technologically advanced, sustainable civilization— what some call an ecological civilization. As Robert Costanza (2000) says, "The most challenging task facing humanity today is the creation of a shared vision of a sustainable and desirable society… that is fair and equitable to all of humanity, to other species, and to future generations."

Many if not all of our current social and ecological crises require both an ability to adapt and an ability to create. Both the Great Unraveling and the Great Transition are clear and prescient, both hold a certain truth, and in many ways, both are already happening. This world is dying and the world that replaces it could be both more beautiful and more chaotic. Too often, efforts are divided between those who focus on transforming systems and those who focus on building adaptation and resilience. Some people accept the inevitability of collapse and work toward deep adaptation;[1] others accept the possibility of nonlinear social change and work toward deep transformation (Lent, 2019). Some people focus on systems change but don't consider transformation deeply enough, while others adapt to social and ecological breakdown but don't offer any civilizational alternatives. It's naïve to think that only one of these approaches is correct.

The crises are too many, too great, and they are coming too fast. We can't solve any without addressing their root causes. The only way to improve life under such hostile conditions is through a deeply rooted collective transformation following principles of justice and sustainability. If we accept the breadth and depth of the transformation required, then even if we fail in some measure, we will still transform in ways that serve everyone amidst the chaos.

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[1] The Deep Adaptation Forum can be found at https://deepadaptation.ning.com/

ii. The Anthropocene Calls for a Shift to a Relational Paradigm

The aim of this dissertation is to acknowledge both the reality of the Great Unraveling and the Great Transition, in the hopes of charting a pathway forward that is commensurate with the scale and depth of the problems we face. The coming crises will be a rare global opportunity to actually solve the root problems that have led us here in the first place. With a realistic understanding of our situation and a commitment to respond effectively, our efforts to create a more just and caring world need not be separated from our efforts to adapt to near-term social collapse. In fact, they can't be.

Inspired in particular by the vision of a Great Transition (Raskin et al., 2012), this dissertation describes how humanity might construct socially desirable and ecologically sustainable ways of life. The presiding assumption throughout this dissertation is that the carrying capacity of the Earth's natural systems cannot sustain modern industrial civilization, so we must revise those aspects of its fundamental character which contribute to the current crisis we all face. Ecological civilization provides a frame for re-envisioning life and re-organizing social systems so that they are equitable and sustainable.

Since the crisis deeply implicates our modern way of life, we can't hope to solve it using the same thinking that created it. Climate negotiations have been ineffective in the face of competing pressures to grow the economy. Although global governing bodies like the UN propose decarbonizing the economy, the strategies they proposed (via the sustainable development goals) contradict one another. They exist within a global development paradigm that disseminates Western knowledge-practices (e.g. scientific resource management) to developing countries without challenging the socio-economic relations of global capitalism

which require unsustainable growth and the exploitation of human labor and natural resources. Sustainability solutions that promote "green growth" are the easiest to accept and implement, but they are the least able to address the roots of today's crises.

Similarly, environmental organizations typically discuss consumption, like most other issues, in terms of supply, not demand, and in terms of top-down (political, economic, and technological) changes, such as the transition to renewables. They focus attention on fossil fuel corporations (coal, gas, and oil) and frame the eco-crisis almost exclusively in terms of CO2 emissions and temperatures rising, while often ignoring structural inequality, the growth imperative, and capitalism. Environmentalists often advocate lifestyle changes that are insufficiently radical. Typically, they encourage individuals to adopt conservation strategies in their own home, without challenging the demands that underlie our capitalist economy. Environmental groups ask us to eat organic and local food, use energy saving light bulbs, drive electric cars, recycle and compost our waste, reduce our water consumption, and buy sustainable products. They ask us to change our consumer habits, but they don't advocate radical systems changes. People must accurately assess the complex nature of interlinking problems before they can propose effective solutions. Palliative actions such as these effectively demonstrate the poverty of today's go-to responses.

Such politically palatable responses represent harmful obfuscations and a doubling down on business as usual. For this reason, the biggest problem we face may not be the systems supporting failure, but the worldview underlying the failure of those systems. Today's mainstream political and economic discourses are increasingly sterile and unfit in large part because they are based on incorrect assumptions about the nature of reality. The whole

explanatory apparatus informing mainstream politics and economics is fundamentally Eurocentric and outdated, informed by centuries' old science and philosophy.

Our way of making sense of the world— our paradigm— shapes our ability to respond to crisis. Once a paradigm is established, it is extremely hard to think and behave outside its limits. The ecological crisis is a very intimate, as well as being a political and institutional crisis, because it calls on us to question the established paradigm within which society operates. It calls for a moment of deep liberation, liberating ourselves not only from unsustainable ways of being, but also from the old tools and languages that limit our responses. In this sense, the eco-crisis calls for a transformation at the deepest level—at the level of our way of making sense of the world.

Today's socio-ecological crises have arisen from particular beliefs, lifestyles, institutions, and power structures that encourage unsustainable dynamics between humans and nature. We need to change the fundamental philosophical assumptions of society, because just changing practices alone does not create sustained change in the end. We now require new forms of knowledge, as A.N. Whitehead (1968) said, "to maintain an active novelty of fundamental ideas illuminating the social system" (p. 174). For paradigm shifts to be genuine, they must be rooted in social and cultural change. Donella Meadows (1999) argues that the most strategic leverage point to inspire large-scale social transformation occurs at the level of mindsets (pp. 17-19). To shift the paradigm requires a different mindset than the one we know today.

In *The Third Window,* Robert Ulanowicz (2009) describes three worldviews that have characterized important shifts in modernity. The first was the mechanical worldview and was inaugurated by thinkers like Descartes, Hume, Kant, Bacon, and especially Newton. The second

was the evolutionary worldview and was inaugurated by Carnot and Darwin. Although the second is an improvement upon the first, it nevertheless discounts more recent discoveries in the importance of cooperation as a driving force between individuals, the theory of emergence in evolution, and the coproduction of nature-cultures. The third worldview, which I call the relational paradigm, is nascent. It is characterized by an ecological or process metaphysics and views systems as causally open and dynamic, influenced by both bottom-up and top-down processes.

Popular concepts of nature and ecology differ depending on our understanding of human-nature relations. Recent debates concerning the origins and significance of the Anthropocene have heightened global interest in better understanding this third worldview. One of the main challenges is of an ontological and epistemological nature, as the very concept of Nature in the modern period was constituted by the separation of humans from nonhumans.

The concept of nature inherited from the Romantics is of wilderness— a pristine natural environment unimpacted by human activity. Although this concept is historically and socially constructed, it persists in the public's imagination. Popular campaigns to promote environmentalism and outdoor recreation depict scenic and exotic environments devoid of people. Conservation ecology views nature and ecology through the lens of scientific management. Nature is conceived as a resource—an object to be preserved or exploited for human ends. Restorative ecology seeks to return environments to their "natural state" before human impact, using strategies of rewilding.

The separation of nature and culture is tied to a colonial history and the political economy of primitive accumulation that generated it. Modern conservation, for example, continues to be

predicated on the extermination and disenfranchisement of indigenous peoples. The heyday of American Conservation and even the romanticism of nature, for example, coincided with indigenous genocide. Today, conservation biologists continue to remove indigenous people from land to make national parks, claiming that scientific conservation is more ecological than indigenous stewardship of land.

In all cases, nature is conceived as an object, not a subject in its own right. The human-nature dichotomy was artificial to begin with, but of course, it created certain affordances. It allowed Enlightenment thinkers a means of domination, it allowed Romantics a means of escape, and today, it allows capitalists and consumers a commodity to exploit or derive pleasure from. This separation jointly promulgates speciesm and racism since the ways in which we classify various animals and humans directs our ways of caring for them. Whether species are considered alien, invasive, or pests and whether people are likewise considered subhuman, foreign, or Other depends on categories that order life to establish places of belonging. Those who are excluded, whether the colonized species or peoples of this planet, are similarly objectified and treated instrumentally, as either natural or human resources. Capitalism's appropriation and exploitation of nature extends this logic on a global scale via the biopolitical control of human and nonhuman populations.

In contrast to the separation and management of nature by humans, an alternative relational understanding of nature-cultures has emerged from discourses on the Anthropocene. The Anthropocene is invariably altering humanity's self-understanding. Discussions around the Anthropocene have unsettled the entrenched binaries which shaped modernity, and which generated its social and ecological crises— traditional binaries between humans and nonhumans,

nature and culture, subject and object, and mind and matter. Concepts of nature have changed as they have become influenced by more complex understandings of human activity as a geophysical force in its own right.

New lenses have appeared that view the Earth as a product of civilizational history, as much as natural history, and that view humanity as inhabited by other species and technologies. The accelerated pace of technological development, the complexification of social organization, and the entanglement of the human and nonhuman, living and nonliving across vast spatial and temporal scales all create the conditions for progressive thought to flourish. Posthumanists like Donna Haraway and Rosi Braidotti as well as new materialists and process thinkers like Jane Bennett, Karen Barad, and Bruno Latour have become particularly interested in understanding the co-production of nature-cultures.

Timothy Morton (2010) uses "mesh" as an apt metaphor for the entanglement of human and nonhuman objects, whether at the micro-level of gut bacteria or the macro-level of climate change. The defining environmental objects of our time, he argues, are hyper-objects which are distributed, non-local assemblages of human and nonhuman objects (Morton, 2013). Global warming is the quintessential hyper-object. It both surrounds us and is reflected in us. We can neither locate it, nor escape it; but we can know it intimately through the air we breathe and the products we purchase. It brings us face to face with the more-than-human.

One may even claim that humans have always been more-than-human—inhabited by other species both in our phylogenetic structure and experience. On the one hand, evolutionary theory has illustrated that every species' genome is a mosaic of genes from other unrelated species, transferred horizontally from one organism to another, rather than just vertically from

parent to child (Jabr, 2014). On the other hand, human-animal studies have explored ways in which humans are materially and discursively dependent on non-humans (DeMello, 2012). Because climate change contests and reconfigures long-standing distinctions between the human, social, and natural sciences, the anthropocentric worldviews that have afforded humanity an exceptional identity and status are now giving way to more embodied and situated knowledge-practices that view humanity in ecological terms.

The Anthropocene does not just inaugurate a time when humanity's impact on nature is experienced viscerally and globally. It also inaugurates a time when shaping the environment is understood to fundamentally shape what it means to be human. Human bodies are now understood to have no discernible limits with their environment. Consciousness and ecology cannot be separated but are continuous and extended (Hutchins, 2010; Thompson, 2007). Geological reality has become human reality (Wapner, 2010). Subjectivity and agency are now understood to be distributed across vast human-nonhuman assemblages, and humanity is situated within networked sets of social, biological, and technical relations. Our capacity to control environments is becoming ever-more elusive.

Just as humans have always been more-than-human (posthuman), nature has always been more-than-nature (postnatural). Leading intellectuals such as Bill McKibben (1989) and Timothy Morton (2007) have called for an "end of nature" or an "ecology without nature." Humans and nature have always been co-constituted, and this is only more evident today, given the reach of our technologies and the ways in which globalization entangles everything. Of course, we have always coevolved with socio-technical advances, whether through the advent of writing, guns, or computers. Now, however, the scale and pace of change is increasing, and we are witnessing

important qualitative changes. Klaus Schwab (2016), founder and executive chairman of the World Economic Forum, says we stand at the precipice of a Fourth Industrial Revolution, in which new technologies fuse the physical, biological, and digital worlds. Our consciousness is now unloaded on smart devices and our lives are increasingly mediated by sophisticated brain-machine interfaces, smart algorithms, and biochemical devices.

These ongoing shifts in our cultural and scientific understanding of the human-nature relationship illustrate our together-ness with environments, objects, and nonhumans. But of course, there are many antecedent intellectual traditions that have explored such territory outside Western discourses. Many aboriginal peoples and premodern cultures practice embodied forms of knowing. These forms of knowing are often situated within relational worldviews that conceive humans as part of nature, and nature as not ontologically divided from humans, but as already co-constituted by humans and nonhumans. Buddhism is one such tradition that challenges the epistemological and ontological basis of Enlightenment thinking and the various bifurcations of nature/culture, subject/object, and mind/matter. Shinto Buddhism's view of sentience, for example, is extended to both animate and inanimate matter; while Zen Master Dōgen famously claimed that mind is not other than mountains, rivers, the earth, sun, moon, or stars (Walsh, 2018).

It is not surprising then that relational epistemologies and ontologies like those found in indigenous wisdom traditions are increasingly relevant for our understanding of humanity's role in the Anthropocene. The complexity of life in the Anthropocene not only questions the relationship between humans and nature; it also demands the development of an ethics that respects the dignity and agency of nonhuman actors, both living and nonliving. Change along

one axis does not necessarily lead to changes along the others. Cultures that embody relational ontologies, epistemologies, or ethics do not necessarily live within equitable and sustainable societies; in fact, historical experiences provide abundant evidence that the two are often causally unrelated. Likewise, the transition to a postcapitalist commons-based economy does not necessarily entail the realization of a relational paradigm.

Nevertheless, this dissertation posits that structuring society— its spiritual, cultural, social, political, and economic dimensions— via a relational paradigm helps it transition toward an Ecological Civilization. The dissertation is therefore speculative insofar as it articulates a horizon of possibility, not an actually existing reality. Given the speculative nature of articulating such a broad and deep scope of transformation, this dissertation will admittedly fail in many respects to accurately reflect its own ambition. Naming a paradigm before it exists is in many ways a fool's errand. By definition, paradigms can only be named after they are realized. The hypothetical relational paradigm is therefore, more than anything, a proposition, as Whitehead would say, intended to spark the creative advance of society.

Many of the discourses affiliated with the relational paradigm are contextually derived from discourse-worlds that significantly differentiate them, and no one should be conflated with another. Rather, these discourses should be understood as providing alternatives to the mechanistic thinking that shapes modern, industrial civilization. The shift to a relational paradigm is understood to be an emergent historical phenomenon, conditioned by the emergence of the Anthropocene and the need to redesign civilization and redefine the human condition in harmony with life and life-affirming processes. *The Systems View of Life* (Capra & Luisi, 2014), *Relational Reality* (Spretnak, 2017), and *The Third Window* (Ulanowicz, 2009) are examples of

work that similarly articulate the paradigm shift discussed in this dissertation. Whereas those works primarily focus on exploring the ideological landscape of the paradigm shift, this dissertation seeks to expand beyond that scope by including a broader range of concerns, such as transformative education and political economy.

iii. Chapter Structure

In Chapter 1, I explore the relational paradigm as a coherent constellation of thought providing a means to challenge the foundational assumptions of modernity, as well as the tools to create a new living story about humanity and its relationship to the Earth. Today's converging social and ecological crises are the result of centuries of broken relationships produced by systems of oppression that prized some lives over others. The fundamental sense of separation and "othering" endemic to the modern dualistic paradigm and the society which it constructed is collapsing under the weight of its dysfunction. The only way to address our ongoing crises and build an alternative of thriving is through restoring the sanctity of our relationships to all life and constructing a society on that basis. Amidst such times of crisis, we can practice caring and healing, while moving toward a relational paradigm and a life-affirming and sustainable society constructed in its image.

Relational thinking has recently gained increasing prominence across academic disciplines in an attempt to understand complex phenomena in terms of constitutive processes and relations. Interdisciplinary fields of study, such as science and technology studies (STS), the environmental humanities, and the posthumanities, for example, have started to reformulate academic understanding of nature-cultures based on relational thinking. Although the sustainability crisis serves as a contemporary backdrop and in fact calls for such innovative

forms of interdisciplinary scholarship, the field of sustainability research has not yet tapped into the rich possibilities offered by relational thinking.

Against this background, the purpose of chapter 1 is to identify relational approaches to ontology, epistemology, and ethics which are relevant to sustainability research. More specifically, I analyze how relational approaches have been understood and conceptualized across a broad range of disciplines and contexts relevant to sustainability to identify and harness connections and contributions for future sustainability-related work. My results highlight common themes and patterns across relational approaches, helping to identify and characterize a relational paradigm within sustainability research. On this basis, I conclude with a call to action for sustainability researchers to co-develop a research agenda for advancing this relational paradigm within sustainability research, practice, and education.

In chapter 2, I apply these various threads of relational thinking to the development of a course to support transformative learning. We need to support ourselves and our communities to respond to collapse with spiritual integrity and a positive vision, and we need an integrated approach that prepares activists, researchers, and organizers to maintain hope while probing the depths of suffering and transforming it. To do that, I offer a relational model for building cultures and communities of liberatory practice. This model leverages somatic, trauma-informed, relational, and restorative practices to help cultivate the shift toward a relational paradigm.

While we aspire to fully integrate and internalize this shift, we all fail in some measure to fully embody and enact healthy forms of relationality. In many cases, we are not able to live them because the structures we live in, which are to some degree beyond our control, don't provide the necessary social support for deep transformation. Our current economic and political

systems are so entrenched in our lives and psychology it's a heroic feat of imagination to even conceive of alternatives. These systems live in our bodies and in our cultures. And these systems react, sometimes even violently, against opposition.

The modern Western paradigm is in active denial of relationality. It valorizes control, self-sufficiency, heroic individualism, and a disembodied, dispassionate disposition. Western ontological discourses are still haunted by bids for an "onto-theology"—a flight from the real, from mortality, and from complexity. Our bids for ontological security are complex responses to our deep fear of vulnerability. The modern Western paradigm is privileged, nevertheless, due to the historical and geopolitical power of western societies. Therefore, it is important not to lose sight of the role of hegemonic political power in privileging certain ontological claims in the world. Indeed, a growing number of scholars such as William Connolly (2011), Sergei Prozorov (2014), Bruno Latour (2013), Marisol de la Cadena (2015), and Mario Blaser (2010) see ontological conflicts as the deeper source of many political conflicts.

Exploring this terrain touches deep (and usually unconscious) foundations of people's identities, so we also need to expect that people can easily feel challenged and even threatened by transforming what they believe constitutes their identities. Personal and social connections need to be formed through relational practices as a precondition for transformation. And relational practices and processes need to be used as communicative methods in themselves to create fields of resonance that create space for transformation to happen.

Developmentally, we also cannot jump from the personal to interpersonal all the way to the political and global precisely because these different dimensions have to organically transform their relationships with each other over time. Considering how deeply engrained they

are, transforming ourselves and our society from one paradigm to another requires a lot of retraining. It requires learning to practice new ways of being in relationship with each other. It's not sufficient to cognitively understand new pathways forward; we have to retrain the body-mind to alter our physiology and shift our social relationships to support change. This often requires non-verbal, embodied, creative, and artistic forms of expression.

Chapter 2 provides a reflexive case study of the design, content, and impact of a course on eco-justice that integrates relational learning with an equity and justice lens. The reflexive case study provides a critical, exploratory self-assessment, including interviews, group discussions and surveys with key stakeholders and course participants. The results show how relational approaches can support transformative learning for sustainability and provide concrete practices, pathways, and recommendations for curricula development that other universities and training institutions could follow or learn from.

In chapter 3, I describe why the climate crisis is a terminal crisis for capitalism and explore what postcapitalist systems might sustainably supersede in and through the global poly-crisis by examining realistic models for sustainable political and economic transformation. First, I consider how the global political economy is undergoing world-historical changes, in response to the pressures of mounting inequality, climate crisis, and the growing illegitimacy of neoliberal capitalism. I examine how current political, economic, social, and technological changes could positively and negatively shape the construction of a new world system beyond capitalism. Then, I map the conditions under which a socially just and sustainable global future could emerge from large-scale structural transformations to contemporary society.

In particular, I explain how commons-based systems can overcome capitalism's contradictions, and feasibly reorient social organization and cultural values around the Great Transition. I will focus specifically on developing a process-relational understanding of the commons to illustrate its unique potential for realizing the Great Transition. Shifting the ontological premises of political and economic thought toward process-relational worldviews could transform society at the deepest level. Likewise, cultivating relational understandings of commoning situates commoning in this larger transformational context. I will explore how commoning shifts the nature of the subject, subjectivity, and human-nonhuman relations through the lens of new scholarship subsumed under the relational paradigm. I will also discuss the importance of relational ontologies to societal transformation and how society might be designed around a relational ontological shift.

Taken as a whole, the dissertation is structured to address multiple facets of the global poly-crisis and provide inter-related pathways to realize the Great Transition, beginning with a literature review on the relational paradigm, applying that to the development of curriculum and trainings, exploring the structural underpinnings of the crisis, and how to build just and sustainable alternatives.

The conclusion of the dissertation provides a concrete outline of strategic next steps for building a commons-based postcapitalist alternative. Although necessarily speculative, this model helps ground the ideas explored in prior chapters to a realistic modeling of how society might be constructed in an ideal scenario. Granted, process-relational philosophy embodies a different theory of change. It does not apply the same spatial metaphors (e.g., micro- / macro-) to reality. Relations are always mediated, not only through inter-personal contact, but through

trans-personal, social processes (i.e., language, law, and money) which are themselves internalized, outside our control, and yet always part of us and open to change. Collectively, the different chapters in this dissertation approach the shift to a relational paradigm from different vantage points, while attempting to articulate a coherent vision of the Great Transition along its major axes.

Chapter 1 Towards a Relational Paradigm in Sustainability Research, Practice, and Education

1.1 Introduction

Shifting the paradigms from which systems arise is said to be the most effective leverage point for creating change (Abson et al, 2017; Meadows 1999). Paradigms shape how we perceive the world, what we believe is possible, and how we understand and address sustainability challenges. It is therefore critical for sustainability scholars to understand the paradigms shaping their field and to orient their work in line with the most advanced theories and practices from fields relevant to sustainability.

In this chapter, paradigms are defined as commonly agreed upon ways of perceiving the world based on linked assumptions which have been accepted into the mainstream (Mackinnon & Powell, 2008). Mainstream approaches to sustainability currently fall mainly within a technocratic paradigm, focused on addressing certain elements of the system without addressing the intrinsic relations between those elements. System science reveals though, that relations between the elements in the system effect the state of the system as a whole (Kauffman, 1995).

Accordingly, various authors have recently argued that a lack of relationality is at the core of many of our current crises and describe what may be considered an emerging paradigm informed by relational thinking using different terms and concepts, such as the ecological paradigm (Hörl, 2017; Ulanowicz, 2009), systems approach (Capra & Luisi, 2014), integral theory (Wilber, 1996), metamodernism (Freinacht, 2017), and constructive postmodernism (Cobb, 2002). As relationality has become a buzz word with many meanings, however, it is

unclear whether different relational thinkers share linked assumptions that constitute an emerging paradigm and to what degree they relate to sustainability.

Against this background, I analyze how relational discourses[2] have been understood and conceptualized across a broad range of disciplines and contexts relevant to sustainability to identify and harness its connections and contributions for future sustainability-related work. For an emerging paradigm to become mainstream, there must be a coordinated shift in our way of being, thinking, and acting. To better understand how assumptions may be linked, I have therefore categorized literature into ways of being (ontologies), thinking (epistemologies) and acting (ethics). These 3 categories were selected as fundamental aspects of relationality based on the work of Varela (1999), Barad (2007), Escobar (2017), Puis de la Bellacasa (2017), and Kassel et al. (2016) who describe relational ways of being, thinking, and acting as a single tri-partite constellation—an ethico-onto-epistemology—that does not presuppose subject-object and nature-culture binaries.

Accordingly, in this chapter, I will identify relational approaches to ontology, epistemology, and ethics which are relevant to sustainability. After describing my method of analysis (Section 1.2), I present what relational approaches to ontology encompass (Section 1.3), how relational approaches to epistemology can shape research practice (Section 1.4), and the normative, ethical orientations underlying relational approaches to sustainability (Section 1.5). On this basis, I discuss the identified trends, themes, and patterns characterizing a relational approach to sustainability, concluding with recommendations for future research (Section 1.6).

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[2] The term "discourse" defines ways to think and communicate about a given subject matter.

1.2 Methodology

This chapter presents a qualitative literature review to analyze how relational approaches relevant to sustainability have been understood and conceptualized. Indications of a relational paradigm come from diverse systems of knowledge in the humanities, social sciences, and natural sciences. Academic literature across multiple disciplines was selected for analysis insofar as they discussed relational approaches to ontology, epistemology, and ethics and were related to the context of sustainability.

Literature was selected based on an exploratory approach, combining the use of scholarly database searches (e.g. Scopus and Google Scholar) with a consultation process with different key stakeholders and informants.[3] The latter involved a total of five workshops and continuous communication with participants through the participatory development of a web-based communication platform and database in the field between 2017-2019.[4] This resulted in the identification of a total of 100 publications for analysis (cf. Sections 3–5). The categorization of the identified papers to the 3 categories (ontology, epistemology and ethics) was based on the following definition of these terms and their relevance for sustainability:

[3] The key stakeholders were identified though a targeted selection of scholars and practitioners and an open call for participation related to the themes of this dissertation. The workshops included a total of 125 participants. Workshop 1 took place from Aug. 14-15 2017 at the IASS Potsdam, Germany, workshop 2 from Aug. 13-16, 2019 at Ratna Ling, workshop 3 from Sept. 9-12, 2019 at Neudenau, Germany, workshop 4 from Sept. 30-Oct. 2, 2019 at the IASS Potsdam, Germany, workshop 5 from Dec. 9-12, 2019 at Duke Kunshan University, China. All workshops aimed at identifying the scientific knowledge base and the identification of current gaps in sustainability research, practice, and education regarding the inner aspects of transformation.

[4] http://www.ama-project.org/

(A) **Ontologies** describe the "assumptions (which may be implicit or explicit) about what kinds of things do or can exist in [reality], and what might be their conditions of existence, relations of dependency, and so on" (Scott & Marshall 2009, p. 531).

(B) **Epistemologies** describe how we come to know the world. They define the criteria, standards, and methods for understanding reality (Steup 2018).

(C) **Ethics** describes "what is morally good and bad and morally right and wrong" (Singer 2019, para. 1). It includes cultural values, morals, and norms shaped by social and political life.

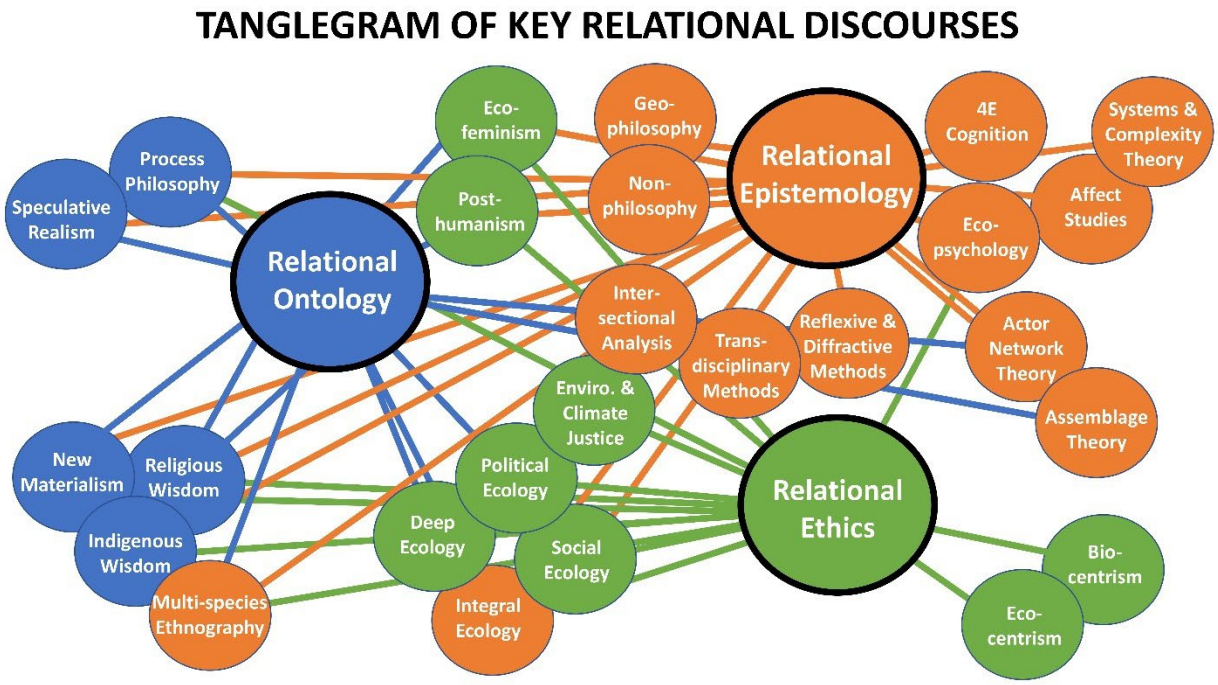
These 3 categories were separated for the purposes of presenting a clear analysis, while acknowledging that the categories and discourses are mutually entangled. As such, the categorization schema is a fuzzy set[5] which assigns discourses membership to a primary category while acknowledging that they relate to more than their assigned category.[6] I separated discourses to highlight specific relationships that could prove helpful in further developing relational approaches to sustainability, whilst I recognize that discourses could be differently categorized, allowing new relationships to become visible. What I construct is therefore one potential functional assemblage that may be explored in future sustainability research. Figure 1 presents a tanglegram (Hodder, 2012), highlighting the identified entanglements of the 26 most

[5] Zadeh (1965) defines fuzzy sets as "a class of objects with a continuum of grades of membership. Such a set is characterized by a membership (characteristic) function which assigns to each object a grade of membership ranging between zero and one" (p. 338).

[6] For instance, posthumanism and ecofeminism make ontological and epistemological critiques, not just ethical ones; nevertheless, they have been included under ethics because unlike other discourses, they are explicitly normative in orientation.

prominent discourses outlined in my analysis (Sections 1.3–1.5).[7] The tri-partite categorization offers a functional framework for developing relational approaches to sustainability in concert with each other, drawing upon the diversity of discourses while respecting both their distinctions and intra-relations.

Figure 1



1.3 Relational Approaches to Ontology

A total of 25 publications were identified as relevant regarding relational approaches to ontology. They come mainly from the fields of philosophy, indigenous and religious studies,

[7] Although certain discourses have been clustered together to designate their relative affinity, the distance between discourses and the 3 categories is insignificant.

cultural studies, and political science. In this context, relevant discourses describing relational ontologies relate to speculative realism, process philosophy, new materialism, indigenous wisdom, and religious wisdom (Figure 1). All relational ontologies posit that "the relations between entities are more fundamental than the entities themselves" (Wildman, 2006, p. 1). No entity preexists the relations that constitute it.

Within the identified literature, the majority of sources describe relational ontologies that can be broadly categorized as either undifferentiated or differentiated. Undifferentiated relational ontologies are monistic, viewing an entity as "an evolving expression of a metaphysical source" (Stout, 2012, p. 389). Ecological holism is a form of undifferentiated relational ontology, for example, that dissolves the distinctions between mind, matter, and life in terms of more fundamental activities of the universe (Smuts, 1926). By contrast, differentiated relational ontologies view reality as an evolving unique expression of complex, relational, multidimensional sources (Stout, 2012, p. 389). The latter conceives identity and difference in relation to each other, whereas the former assimilates differences in more fully encompassing forms of identity. The difference between undifferentiated and differentiated relational ontology is consequential for sustainability research. White et al.'s (2016) comprehensive survey of hybrid theoretical approaches to society and nature demonstrates the importance of taking a differentiated relational approach, so as to understand the mutual relations between social and ecological systems without dichotomizing or subsuming one into the other.

Contemporary discourses on relational ontology in Western thought were identified as belonging to speculative realism, process philosophy, and new materialism. Speculative realism (hereafter SR) is a heterogenous body of thought in which various philosophies posit very

different alternatives to the bifurcation of nature/culture and the anti-realism of modern Enlightenment philosophy. SR's core commitments are to a renewed willingness to entertain speculative metaphysics and ontological realism in an attempt to overcome the problem of *correlationism*. As most famously described by Kant, correlationism posits that an object cannot be known outside its relationship to the mind, such that knowledge of reality is always a correlation between thinking and being (Bryant et al., 2011). SR seeks various ways to describe reality outside this contradiction.

Process philosophy is an antecedent of SR known to possess a differentiated relational ontology (Faber & Stephenson, 2011; Keller & Daniell, 2002; Shaviro, 2014). The progenitor of process philosophy, Alfred North Whitehead (1929), posited that every actual entity composes societies of ever-greater societies, while being both internally related and differentiated from other actual entities. The social, he claimed, "is a way of describing how each entity is constituted by and through its environment" (Halewood, 2011, p. 121). Recent works by Henning (2005), Ims et al. (2015), Stengers (2015), Muraca (2016), Latour (2017), Kaaronen (2018), and Mancilla et al. (2019) demonstrate the multiple ways process-relational ontologies shift epistemological and ethical orientations to human-nature interactions based on an understanding of their co-constitution. Bruno Latour (2017) is probably one of the best-known authors writing about process philosophy and ecology who argues that the Earth should be conceived as a complex assemblage of living and agential processes which should be given political standing.

Another heterogenous body of thought that develops relational approaches to ontology in the context of sustainability is new materialism. New materialism makes a core commitment to

experiment with post-Cartesian ontologies that explore the variegated relationships between different nature-cultures. New materialists generally employ multi-modal methodologies that examine various levels (micro-, meso-, and macro-) of socio-ecological systems simultaneously (Coole & Frost, 2010). Jane Bennet is, for instance, one of the better-known new materialists. In *Vibrant Matter* (2010), she develops a "vibrant materialism" that (like Latour) attributes agency to nonhumans, and that (like Whitehead) views living and non-living matter as co-constituting assemblages.

These discourses on relational ontology (SR, process philosophy, and new materialism) are comparatively recent developments emerging within Western thought. Most relational ontologies have however developed historically outside the West for millennia (Todd, 2016). Worldwide, there are many non-modern, earth-based, indigenous, and religious ontologies that never inherited the bifurcation of nature/culture characteristic of the Western modern worldview. These traditions all focus on the inter-related, inter-dependent, and inter-active aspects of nature-cultures. Unlike Western environmentalism, these traditions do not relate to the environment as something "out there" that needs to be protected. Landscapes are considered both physical and mental phenomena, bearing the markings of personal and collective biographies, task-scapes, customs, rituals, and cosmologies (Miller et al., 2014; Miller, 2017). Indigenous peoples of the Americas, for example, follow a relational ontology based on kinship. They perceive themselves and nature as part of the same family sharing origins and ancestral bonds (Datta, 2015; Posthumus, 2018; Salmon, 2000).

1.4 Relational Approaches to Epistemology

A total of 52 publications were identified as relevant regarding relational approaches to epistemology. They come mainly from the fields of cognitive science, psychology, sociology, philosophy, science and technology studies, feminism, and sustainability science. Relevant discourses describing relational epistemologies within the identified literature relate to 4E cognition, affect studies, ecopsychology, assemblage theory, actor-network theory (ANT), multi-species ethnography, integral ecology, geo-philosophy, non-philosophy, transdisciplinary (TD) methods, intersectional analysis, systems and complexity theory, and reflexive and diffractive methods (Figure 1).

There is broad consensus that modern western epistemologies arising from the Enlightenment and scientific revolution are largely responsible for creating profound divisions and patterns of exploitation between humans and nonhumans. Their intellectual foundations were formed by figures such as Isaac Newton, Immanuel Kant, David Hume, John Locke, Francis Bacon, and René Descartes (Griffin, 2001). They posit: (1) The idea that causation is determined only by external relations between objects; (2) that no object can be understood outside its relation to thought; (3) that primary and secondary (sensible) qualities are separable and that science can objectively study the former without the latter; (4) that nature can be mastered, "her" secrets revealed to instrumental reason and scientific "progress"; and finally, (5) that mind and body are separable substances, and that the latter is the domain of objective scientific inquiry. These ideas formed the philosophy of empiricism that shaped the development of science, technology, and industry throughout the modern period. Though these ideas have been profoundly influential in shaping society, as Bruno Latour (1991) argues, we have never been

truly modern. Despite modern people believing nature could be understood objectively, scientific knowledge is fundamentally shaped by social relations and practices. Researchers have always shaped and been shaped by the objects of their research. As such, many researchers now increasingly use reflexive methods to account for the observer's role in shaping knowledge (May & Perry, 2017).

In this context, the identified relevant literature from the field of cognitive science uses embodied, embedded, extended, and enactive (4E) approaches to cognition to scientifically understand the complex and dynamic interactions between coupled brain-body-environment systems (Clark, 2008; Varela, Thompson, & Rosch 1991). Evan Thompson (2007), for instance, argues that closing the explanatory gap between consciousness and life is possible by incorporating phenomenological accounts of experience into scientific accounts of mind and life. Frequently, 4E approaches are also called 4EA, so as to include the growing field of affect studies (Gregg & Seigworth, 2010)—an interdisciplinary body of research taking relational approaches to emotions (Slaby, 2016) that has examined emotional relationships to environments (Bladow & Ladino, 2018), media ecology (Angerer, 2017), and body politics (Protevi, 2009).

The review of relevant literature in psychology stipulates that identity-based, value-based, and socio-cognitive approaches provide the best ways of bridging knowledge of personal and social-ecological transformation (Bögel & Upham, 2018, p. 18). Ecopsychology is a branch of psychology that draws upon the ecological sciences to study the constitutive relations between minds and environments (Kanner et al., 1995; Fisher, 2013). Studies on ecopsychology are typically concerned with the ecological unconscious, phenomenology, the interconnectedness of all beings, the transpersonal, and the transcendental (Kahn & Hasbach, 2012).

The review of the identified social scientific literature shows a growing interest in relational approaches to knowing. These approaches allow social scientists new methods for analyzing human-nonhuman relations. Assemblage theory (DeLanda, 2006) considers all things living and non-living to be assemblages of human and nonhuman parts. Several methods for studying assemblages have developed in empirical work (e.g. Baker & McGuirk, 2017; Feely 2019; McFarlane, 2011). Actor-network theory (ANT) is among the relational methods most frequently used in the social sciences (Latour, 2005). It does not position humans at the center or apex of agency and responsibility, but rather, considers agency to be distributed among various actants—none of which are themselves solely responsible for change. It studies how agency is formed by an interlinked chain of beings and processes, rather than any individual. To write about agency outside humanist epistemology, scholars frequently employ multi-species ethnography (e.g. Kirksey & Helmreich, 2010; Kirksey, 2014; Multispecies Editing Collective, 2017).

In the field of philosophy, my review shows that relational epistemologies are being developed to help us think transversally across different geo-social scales. Integral approaches to ecology, also known as integral ecology, cross boundaries between the humanities, social sciences, and natural sciences (e.g. Esbjörn-Hargens & Zimmerman 2009; Mickey, 2014; Mickey et al., 2017). O'Brien and Hochachka (2010), for example, use integral theory to develop a multi-disciplinary, multi-perspectival understanding of climate change adaptation. Deleuze and Guattari's geo-philosophy is another approach to traversing mental, social and environmental ecologies (Bonta & Protevi, 2004), as is Francois Laruelle's non-philosophy, which provides a method for different ways of knowing (e.g. theologically, philosophically, and scientifically) to inform each other without imposing hierarchies (Smith, 2013). These emerging philosophical

approaches offer ways to think ecologically; not just to think "about ecology," but rather to think in terms of a "general ecology" (Hörl, 2017). Morton (2013; 2016) exemplifies work in this mode. He defines ecological awareness as a knowing that loops in on itself, as in a meditation, where one becomes familiar with "the mesh" of interrelated happenings and their constitutive relations to oneself.

Transdisciplinary sciences have also begun developing relational approaches to knowing (Craps & Brugnach, 2015; Nicolescu, 2002; Van Breda and Swilling, 2018). Systems theory (incl. general systems theory, cybernetics, and complexity theory) is among the most prevalent discourses within these sciences (cf. Barile et al., 2018; Preiser et al., 2018). According to Capra and Luisi (2014), systems thinking developed in the 1920s by biologists, Gestalt psychologists, ecologists, and quantum physicists. It is characterized by several important shifts of perspective: from the parts to the whole; from disciplines to multidisciplinarity; from objects to relationships; from measuring to mapping; from quantities to qualities; from structures to processes; from objective to epistemic science; and from Cartesian certainty to approximate knowledge (pp. 80-82).

Feminist scholars offer important socially situated epistemological discourses, including standpoint theory (Harding, 1991), situated knowledges (Haraway, 1988), and intersectional analysis (Crenshaw, 1989). These discourses politicize and ethically orient sustainability research and have been most frequently employed within environmental justice scholarship (e.g. Kaijser & Kronsell, 2014; Malin & Ryder, 2018). Feminist scholars have also developed diffractive methods to overcome the shortcomings of reflexive methods (e.g. Barad, 2007; Bozalek & Zembylas, 2017; Hill, 2017). Diffractive methods are used to read the insights of one

discipline through another discipline to generate novel insights in the relation between differences (e.g. Doucet, 2018; Gullion, 2018; Larson & Philips, 2013; Massei, 2014).

Finally, my review shows that in the field of sustainability science, scholars increasingly call for developing empirical methods that account for subjectivity and its role in shaping scientific practice (cf. Wamsler et al., 2018). Manuel-Navarrete (2015) claims for instance that research on "mind maps" and "mental models" provide generalizable ways of objectively analyzing subjectivity and integrating it in systems research and institutional arrangements.

1.5 Relational Approaches to Ethics

A total of 23 publications were identified as relevant regarding relational approaches to ethics. They come mainly from the fields of sustainability science, philosophy, religious studies, and cultural studies. Relevant discourses describing relational approaches to ethics within the literature studied include biocentrism, ecocentrism, deep ecology, social ecology, political ecology, environmental and climate justice, ecofeminism, and posthumanism (Figure 1). The latter five discourses have been provisionally included under the category of ethics. Although they have shaped understandings of ontology and epistemology, they are nevertheless normative discourses influencing values, morals, and norms, especially at a societal level.

The identified dominant relational approaches to ethics within the fields of environmental and climate ethics include biocentrism and ecocentrism. Biocentrism and ecocentrism attribute moral significance to biological organisms and ecological systems respectively. Collectively,

they are committed to non-anthropocentrism, meaning that they do not position human interests at the center of moral concern.[8]

Deep ecology is an influential discourse, emphasizing the need to shift consciousness as a prerequisite for shifting modern industrial society toward a more sustainable paradigm. It was coined by the Norwegian eco-philosopher Arne Naess. Naess contrasts deep ecology with shallow ecology, arguing that whereas the latter views nature anthropocentrically in terms of nature's utility for us, deep ecology mines resources from spiritual, religious, and philosophical traditions to view nature eco-centrically. Although there can be many different versions of deep ecology, Naess' version (ecosophy 'T') is informed by Spinoza, Mahayana Buddhism, and the Gandhian philosophy of non-violence. As conflicts of interest arise, the health and flourishing of humans and nonhumans are considered holistically, such that the vitality of higher order (more complex) systems is protected over that of lower order systems (Drengson & Devall, 2010).

Critical scholars contend that deep ecology has an apolitical view of systems change, so they claim it is important to integrate deep ecology with social ecology (Slocombe, 2002). Gary Snyder is one example of a thinker who has integrated both deep and social ecology in his activism and writings (Messersmith-Glavin, 2012). As developed by Bookchin (Biehl, 1999), social ecology adds a critical perspective on class-based struggles of marginalized people by considering how ecology is informed by social hierarchy and domination. Radical social ecology investigates the material, social, and spiritual conditions of an ecological society by pursuing the elimination of human's domination of nature via the elimination of human's domination of

[8] Non-anthropocentric approaches to environmental and climate ethics are collected in Henning and Walsh (2020).

humans. It connects ecological issues to a broad array of interconnected social issues (Bookchin, 1980).

Similarly, political ecology examines asymmetrical distribution of resources and power, helping to address the structural causes, not symptoms of sustainability challenges (Robbins, 2012). Environmental and climate justice scholarship applies the methods of intersectional analysis in social and political ecology to the modern environmental movement. By forming alliances with marginalized groups, environmental and climate justice activists and scholars integrate personal and socio-ecological transformation by addressing both social justice issues (especially race, gender, and class-based injustice) in relation to ecological issues (like air pollution, waste disposal, and access to clean water) (Carder, n.d; Mohai, Pellow, & Roberts, 2009).

Among the identified literature from social and political ecology, ecofeminism is among the most important and influential discourses. Ecofeminism "seeks to understand the interconnected roots of all domination," connecting the oppression and domination of women in particular and marginalized groups in general to the oppression and domination of nature (Plant, 1991, p. 101). Plumwood (1993) connects the logic of domination to dualistic structures of reasoning in Western thought. Male/female, mind/body, civilized/primitive, and human/nature dualisms, she argues, naturalize unequal and exploitative relationships based on the domination of subordinate groups. Other noted ecofeminists like Merchant (1980) and Shiva (1989) document how science, technology, and economic development espouse ideas of progress tied to the control and mastery of nature and of women; while spiritually informed ecofeminists such as

Ruether (1992; 2005) develop religious responses to these critiques, emphasizing the liberative potential of cultivating feminine principles in society.

In making the claim that women are closer to nature, however, some (but by no means most) ecofeminists have problematically upheld gendered concepts of nature that fail to overcome the dualistic thinking underlying the logic of domination (Gaard, 2011). Ecofeminism has since become more critical, intersectional, materialist, and posthumanist (Alaimo & Hekman, 2008; Gaard, 2017). Prominent recent works include Alaimo (2010), Braidotti (2013), Zylinska (2014), Haraway (2016), Keller (2017), and Puis de la Bellacasa (2017). Posthuman feminists reject essentialist concepts of gender, and are much more technomaterialist, viewing human-nonhuman relations as materially informed by socio-technical systems. Posthumanism does not relegate its interest to animal (zoologic) encounters but explores relations of all kinds—both between biological beings (like symbionts or holobionts) and cyborgs (or flesh machines).

1.6 Discussion and Conclusions

My review of the existing bodies of literature that take relational approaches to ontology, epistemology, and ethics relevant for sustainability has identified important developments, common themes, and patterns that constitute characteristics of a relational paradigm (and possible shift towards a relational paradigm) in sustainability research. Despite differences between the various perspectives cited, all describe a paradigm that (1) is grounded in a relational ontology, (2) emphasizes the need for understanding human and non-human nature as mutually constitutive, and (3) values more-than-human relations.

My analysis shows that **relational ontologies** aim to overcome the bifurcation of nature/culture and various other dualisms (e.g. mind/matter, subjectivity/objectivity) shaping the

modern worldview. Differentiated (as opposed to undifferentiated) relational ontologies respect the integrity of individuals while understanding how their being is fundamentally constituted by relations of all kinds. In this context, speculative realism, process philosophy, new materialism, and indigenous and religious wisdom traditions are systems of knowledge providing particularly well-developed understandings of relational ontology relevant to sustainability.

My review also shows that **relational approaches to epistemology** account for the observer's role in shaping knowledge; acknowledge that agency is distributed across networks; view objects as assemblages of humans and nonhumans; increasingly focus on transdisciplinary methods to cut across disciplinary boundaries; and use diffractive methods to integrate different ways of knowing.

Lastly, my review shows that **relational approaches to ethics** include non-anthropocentric perspectives; value non-human nature in non-instrumental terms; use intersectional methods to analyze the inter-relations between social and ecological issues; and contextualize human-nature interactions in light of asymmetrical power relations and dynamics between assemblages or networks of interest.

This chapter discretely analyzed relational approaches to ontology, epistemology, and ethics in an attempt to outline avenues to further develop them as a tri-partite constellation in future sustainability research, practice, and education.[9] Accordingly, the results and the developed analytical tri-partite framework on which they were based, can enable scholars and practitioners to identify and harness the contributions of relational approaches to sustainability in a more systematic way.

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[9] The web-based platform, upon which this research is partly based, has been developed to support such a task: http://www.ama-project.org/

Currently, there exist only a few studies that explicitly take, to some extent, relational approaches to sustainability. These include research in fields, such as resilience (e.g. Lejano, 2019; Darnhofer et al., 2016); socio-technical transitions (e.g. Garud & Gehman, 2012; Chilvers & Longhurst, 2015; Haxeltine et al., 2017); sustainability education (e.g. Lange, 2018; Mcphie & Clark, 2019; Netherwood et al., 2006; O'Neil, 2018; Taylor & Pacini-Ketchabaw 2019; Williams, 2013); environmental values (e.g. Jax et al., 2018; Pascual et al., 2018; Saxena et al., 2018); posthuman sustainability (e.g. Cielemęcka & Daigle, 2019; Fox & Alldred, 2019; Smith, 2019); and quantum theory in sustainability (e.g. O'Brien, 2016; Rigolot, 2019). In spite of such exceptions, few sustainability researchers make explicit the related discourses outlined in this chapter.

In fact, my analysis shows that relational approaches are marginalized within sustainability scholarship, despite the broad academic interest in relationality emerging across other fields. This article therefore calls scholars to consider the identified discourses in future sustainability research, practice, and education.

The identified relational approaches provide a basis for integrating so-called "inner" and "outer," "personal" and "collective" dimensions of sustainability without presupposing the logic of dualism underlying that language and framing. Ives et al. (2019) recently called for exploring relations among these dimensions, rather than discussing them as discrete dimensions.

Based on my results, I call for further research to better understand the generative interconnections between these various discourses and dimensions. More specifically, I call for further research that investigates how relational ontologies, epistemologies, and ethics intra-act to compose a relational approach to sustainability. In this context, intra-action means "*the mutual constitution of entangled agencies*. That is, in contrast to the usual 'interaction,' which assumes

that there are separate individual agencies that precede their interaction, the notion of intra-action recognizes that distinct agencies do not precede, but rather emerge through, their intra-action" (Barad, 2007, p. 33). On this basis, I conclude with a call to action for sustainability scholars and practitioners to co-develop a research agenda for advancing a relational paradigm within sustainability research, practice, and education based on relational ways of being, knowing, and acting.

Chapter 2 A Relational, Justice-Oriented Approach to Transformative Sustainability Education and Training

2.1 Introduction

Given that the Earth-system is a complex adaptive system coupled with social systems, it is crucial that education programs support capacities for dealing with complexity, uncertainty, and transdisciplinarity to effectively address sustainability challenges (Lang et al., 2012; Schellnhuber, 2002; Schmuck & Schultz, 2002). Current mainstream education, however, tends to teach students to "think the world to pieces," through analysis, compartmentalization, or reductionism (McInnis, 1972). In fact, today's educational policy and practices are rooted in modern ontological and epistemological traditions that reflect what Gregory Bateson (1982) referred to as an illusion of separation from nature. The "modern curriculum" fragments "the world into bits and pieces called disciplines and subdisciplines" (Orr, 1991, p. 52). As a result, mainstream education typically fails to teach students how to understand and address the complexity of today's interrelated social and ecological problems.

Transformative learning was developed as a response to such shortfalls.[10] It is learning that aims to transform our existential understanding of humanity, including interrelationships both among humans and between humans and non-humans, and the fundamentals of wellbeing

[10] Transformative learning, also called transformational learning, was developed by Jack Mezirow in 1978. It was used to shift one's way of being in the world by shifting one's perspective and thus "affects personal understanding of ourselves, relationships with other people, ways of thinking, belief systems, responses to environment, and overall interpretation of the world" (Simek, 2012, p. 1). Transformative learning has most commonly been used in adult and higher education to shift from mere conceptual learning towards self-directed, experiential, practical, and applied adult learning (Cranston, 2019). Using transformative learning theory to inform sustainability education was first recognised at the 8th International Transformative Learning Conference in 2009 (Lange, 2012).

(Laininen, 2019). On this basis, it "aims at developing a holistic worldview and deep realization and coherence of the purpose, direction, values, choices and actions of one's life" (Laininen, 2019, p. 183). It is presumed to lead to the emergence of learning communities and ecosystems in which new lifestyles and more widespread cultural transformations can support sustainability in society (Laininen, 2019; Lange, 2018). This requires transforming how we relate to ourselves, to each other, to the environment, and to the future (Wamsler & Restoy, 2020).

At the same time, increasing experience with, and research on, transformative learning has also illustrated its limitations (Taylor & Cranton, 2013). Accordingly, scholars have increasingly suggested that relational modes of knowing (epistemology), being (ontology) and acting (ethics) would offer significant possibilities for revitalizing the field of transformative learning (Lange, 2018; Walsh et al., 2020). This need is supported by a growing body of scholars from various disciplines who emphasize that a broader cultural transformation towards sustainability requires a shift toward a relational paradigm (cf. chapter 1).

A relational shift is thus urgently needed to better orient transformative education towards sustainability, yet it has not so far been realized and related methods are lacking (Spretnak, 2017). Such a shift can be characterized as a turn toward a relational ethico-onto-epistemology, which Karen Barad refers to as a single tri-partite constellation that does not presuppose subject-object and nature-culture binaries (Barad, 2007). Although few examples exist (e.g. Mcphie & Clarke, 2019; Netherwood et al., 2006; Taylor & Pacini-Ketchabaw, 2019), relational approaches to sustainability and transformative education are under-studied and vastly under-employed (Lange, 2018; O'Neil, 2018; Walsh et al., 2020; Williams, 2013).

Relational approaches to transformative education are not only key to advance transformative learning, they also have the potential to support social justice goals (Lange, 2018). Social justice issues are important for transformational education to facilitate societal change and activate transformation towards sustainability (Tomlinson-Clarke & Clarke, 2016). However, social justice issues are often not adequately addressed in sustainable education (Bradley, 2009; Friesen, 2014; Godfrey, 2015). Despite the fact that "social inequality and imbalances of power are at the heart of environmental degradation, resource depletion, pollution and even overpopulation" (Bullard, 1993, p. 23) the intertwined issues of justice and equity are still insufficiently addressed (Brechin, 2008; Lever-Tracy, 2010; O'Brien & Leichenko, 2019). Social-ecological transformation is in fact an intergenerational equity issue, including all people on this planet and future generations (Schneidewind, 2019). It should allow for people's flourishing now and into the future "whilst living within the limits of supporting ecosystems" (Agyeman et al., 2003, p. 5).

While the concept of climate justice has been around for decades (Adams & Luschinger, 2009), understanding how systemic social, economic, political, and institutional mechanisms make it possible for the world's richest people and countries to contribute most to the problem is only recently being mainstreamed amongst certain segments of the US population. While few Americans understand that some groups are more vulnerable than others and that the impacts of climate change are being experienced disproportionally by BIPOC and low-income communities (Adams & Luschinger, 2009). According to Leiserowitz et al.'s (2014) research findings, even amongst the "alarmed" and "concerned" population segments (which correspond to 13% and 31% of the US population overall), less than half (on average) were able to identify which types of Americans are more likely to experience health problems related to global warming. Individuals

within the “cautious” (23% of the overall US population), “disengaged” (7%), “doubtful” (13%), and “dismissive” (13%) segments are on average less than 30% likely to be able to identify climate change injustices. Even the most ardent environmentalists working within mainstream environmental change organizations have blind spots about the ways that colonialism and racism manifest in institutions of environmental power (NoiseCat, 2019).

The Ecojustice Course, which is assessed in this chapter, was developed to address current shortfalls in sustainability education and training. In fact, it was developed to foster transformative learning towards sustainability using a relational, justice-oriented approach. After a description of the methodology (Section 2.2), the assessment of its development (design and content) and impact are presented (Section 2.3 and 2.4-5), before I conclude with lessons learned and recommendations for curricula development that other universities and training institutions could learn from (Section 2.6).

2.2 Methodology

This chapter provides a reflexive case study of the EcoJustice Course, which was developed and implemented during 2018-2021. More specifically, I assess the following four phases of its development and implementation:

Phase I: Development of the EcoJustice Course

The development of the EcoJustice course was the outcome of a broad consultation process between the Courage of Care Coalition in the United States and the A Mindset for the Anthropocene (AMA) project at the Institute for Advanced Sustainability Studies (IASS) in Germany. It was informed by a series of five workshops and a literature review. The workshop

participants were identified through a targeted selection of scholars and practitioners and an open call for participation related to the themes of this dissertation. For more information regarding the literature review, the list of identified publications and their analyses, please see chapter 1 in this dissertation.

The assessment of this phase provided critical input for the course development process and the resultant curriculum of the first prototype (see Results Phase 1 [Section 2.3] for a summary of the curriculum). More specifically, it provided the scientific knowledge base and the identification of current gaps in sustainability research, practice, and education which the course was based on.

Phase II: Prototype in Ratna Ling

The goal of the second phase was to implement the first prototype via in-person education, and to experiment with various practices that were developed to foster a relational paradigm. It was implemented during a 2.5-day workshop from August 14th to August 16th, 2019 at the Ratna Ling retreat center in California, USA. Participants were selected and invited by invitation-only based on their expertise in areas relevant to the course. They included contemplative scholar-practitioners, equity and systems change workers, activists, and sustainability scholars.

The overall purpose of the prototype implementation was to deepen our understanding about the impact and effectiveness of the developed content and practices, and to learn from other practitioners. The assessment of this phase was based on participatory observation, two group discussions (cf. Table 1) and a follow-up survey (cf. Table 2). This way, participants could

provide different input and experiences that helped rapidly crowdsource feedback to enhance the course. Among the 17 participants, there were: 9 male, 8 female; 14 North Americans, 2 Europeans, and 1 Asian; 7 spiritual activists and contemplative practitioners, 6 university professors in relevant fields, and 4 sustainability researchers.

Table 1: Leading Questions for Group Discussions for Each Capacity

LOVE	•How do you experience the non-separation between inner and outer ecology? •What, if any, practices or traditions have informed your own relational approach and understanding? •How do you sense your intrinsic relationships with the web of life and life processes (e.g. plants, animals, minerals, water, etc…)? •How do you sense your disconnection? •How can we build care-based systems and structures that enhance the quality of our relationships (to each other, to non-humans, to life cycles, etc…)?
SEE	•What is the history of people's relationships to the environment in which you live? •Try mapping some place-based connections to your bioregion or community. How you are situated in the urban / rural ecology around you? •How does un/sustainability shape subjectivity (e.g. our ways of experiencing, relating, and being in the world)? •How does your way of being in the world reproduce the underlying histories, patterns, and dynamics of un/sustainability? •How do you experience the differential impacts, responsibilities, and experiences of those suffering from various social-ecological crises? •How does your privilege (class, race, gender), biases, etc… inform your experience?
HEAL	•What is your experience with the seven stages of grief? Where do you get stuck? •How have you internalized systems of eco-crisis? •How are your experiences and relationships informed by an industrial growth paradigm? •How is this related to other systems of oppression? •Consider your frequent responses to stress and conditioned tendencies: How have they served you? What is their shadow side? Could you meet your underlying needs in healthier, more sustainable ways?
ENVI-SION	•What do you think the future will be like? •What are the hidden assumptions of your vision of the future? •How are your hidden assumptions informed by your culture (e.g. ideas about gender, nature and technology, values and traditions, etc…)? •What is your preferred future? How might you get there? •Are there ways to orient yourself more clearly toward your preferred future?

ACT	•Take a personal inventory and/or community assessment of your strengths and weaknesses. Can you identify the boundary conditions, constraints, and conditions of support for taking effective action? •When is it more or less appropriate to reform, resist, or create alternatives? •What are your unique personal capacities to affect transformation based on your skills, experiences, talents, privileges, social networks, etc…? •What relationships empower you to affect change, given your individual role and circle of influence?

Phase III: Online Course at LUCSUS

Based on the results from phase II, the EcoJustice course was turned into an online course, and then tested in the context of a Master's Program on Environmental Studies and Sustainability Science at the Lund University Centre for Sustainability Studies (LUCSUS) in Sweden. More specifically, the EcoJustice course was implemented as an obligatory component of the Master's level course on "Sustainability and Inner Transformation." The course took place from November 2019 to January 2020, including 24 students. The course was repeated Nov. 2020 to Jan. 2021 though feedback from that period was not included in this analysis.

Data was collected during the course period (from online discussion platforms) and afterwards through in-class group discussions (cf. Table 1) and a follow-up survey (cf. Table 2). Among the 24 participants, there were: 18 female, 6 male; 12 Europeans, 5 Asians, 4 Latin Americans, and 3 North Americans. Finally, the empirical results from phases II and III were also compared to existing literature to validate identified patterns.

Table 2: Survey Questions Regarding the Implementation Process

LOGIC AND FLOW OF MODULES	•Did the underlying logic and flow of the sessions (love, see, heal, envision, act) support your learning? •What were related strengths and weaknesses?
PRESENTATIO	•How did the presentations and practices resonate with you?

NS AND PRACTICES	•What were their strengths and weaknesses? •What was particularly helpful for you?
PERSONAL, SOCIAL, AND ECOLOGICAL DIMENSIONS	•How did you experience the interrelation between personal, social, and ecological transformation? •How well did we integrate these aspects to link inner and outer transformation?
GAPS AND BLIND SPOTS	•Did you feel at any point that something was missing for you? •What would you like to add or change? •Were there things you did not feel comfortable sharing? •How could this be addressed by the course/online format?
FOLLOW-UP AND FUTURE WORK	•What question(s) are you sitting with after the online course? •How do you plan to integrate the learnings of the course in your daily work?

Phase IV: Revision of Online Course for Climate Activists

Based on the results from phase II and III, the EcoJustice course was significantly revised with a new team of interdisciplinary partners with expertise in environmental sciences, environmental justice, contemplative practice, decolonial methodologies, indigenous knowledge, clinical psychology, trauma-informed care, anti-oppressive pedagogy, and community-building skills. The EcoJustice course was revised to create a greater and more coherent emphasis on environmental justice and contemplative-based, anti-oppressive practice, while also adapting it as a 100% online webinar series that primarily served the needs of climate activists.

The course was redesigned to support frontline workers who are already engaged in climate change mitigation and/or adaptation initiatives to continue their climate work in a sustainable and hopeful manner. Climate activists are well aware of the dire circumstances we are facing, and the risks and impacts of climate change on mental health are already rapidly accelerating (Hayes et al., 2018). Many activists report frequently feeling sadness, fear, and anger, and frequently suffer from burnout, pre-traumatic stress, or climate trauma (Chen & Gorski, 2015; Kaplan, 2020). Those directly experiencing damage caused by climate change are

even more susceptible to experiencing adverse mental health symptoms (Environment Agency, 2020). Many climate activists who experience the adverse effects of climate change are also pivoting from decades of work attempting to avert the climate crises to work focused on building adaptation and resilience in response to social collapse (Bologna & Aquino, 2020).

Participants of the revised course were recruited online publicly using the team's personal and professional networks. The recruitment process targeted front-line climate activists, researchers and other individuals who mostly fall within the "alarmed," "concerned" and "cautious" segments and who are struggling with burnout, anxiety, hopelessness, climate trauma and/or climate grief. Participants completed a pre-survey that consisted of basic demographic questions as well as questions related to their current climate concerns and their prior experience in climate justice and/or wellness programs. Two cohorts participated in the revised course during the summer of 2021.

The curriculum began with a two-hour welcome session followed by five consecutive, weekly two-hour trainings following the five modules (cf. Table 1). The aims of the revised course were to support participants' psycho-social health and sustain their climate-related engagement, as well as to explore ways in which the revised course helps climate activists understand the concepts of environmental justice— that is, how ecological hazards and climate disasters have the harshest impacts on people of color, native tribes and those on low incomes,

the ways in which climate change and white supremacy are interconnected, and how justice-oriented solutions must address these interconnections.[11]

2.3 Results Phase I

Due to the fact that the course was aimed to address current shortfalls in sustainability education and transformative learning (cf. Section 2.1), the development of the curriculum (and its relational, justice-oriented approach) required a broad consultation process and a critical review of current knowledge and approaches. In fact, in order to be able to apply relational approaches to transformative education, we first needed to identify what these relational approaches in the context of sustainability consist of.

The results of the broad consultation process and review (cf. Section 2.2) were peer-reviewed and published (Walsh et al., 2020), and were key for the curriculum development. They influenced: (1) the development of the content of the different course modules, (2) the selection of related practices, and (3) the establishment of cooperation with practitioners and scholars in the field, which was important for the following phases II and III (cf. Section 2.4). In fact, the established cooperation ensured for instance the successful implementation of the phases II and III through the identification of relevant participants for the first prototype implementation and the testing of the online version in cooperation with Lund University (cf. Section 2.4).

[11] The website for the revised course can be viewed here: https://courageofcare.org/ecological-justice/

The identified relational modes of knowing (epistemology), being (ontology) and acting (ethics) in the context of sustainability (cf. chapter 1), which in the following guided the curriculum development, were defined as follows:

> RELATIONAL EPISTEMOLOGIES acknowledge the observer's role in shaping knowledge and call for transdisciplinary, intersectional, and diffractive (nonrepresentational) methods to ensure the integration of different ways of knowing for sustainability.
>
> RELATIONAL ONTOLOGIES posit that no entity preexists the relations that constitute it. All entities emerge out of their constitutive relations. Personal and socio-natural processes are mutually entangled and co-shaping sustainability.
>
> RELATIONAL ETHICS describe non-anthropocentric perspectives about which actions are conducive to human-nonhuman flourishing as an essential aspect of sustainability.

In order to identify the most adequate teaching methods regarding these relational approaches towards sustainability and to ensure a justice lens, during the consultation process it was also decided to co-develop the curriculum with the Courage of Care Coalition, because of its extensive experience with transformative learning to support social justice. Courage of Care has developed a social movement-based strategy that aligned well with the ideas of the EcoJustice course. It aims to help individuals and organizations develop compassionate, just, and equitable communities of practice through training in relational care practices (loving), anti-oppressive pedagogies (seeing), restorative healing tools (healing), visionary and artistic tools (envisioning) and systems thinking (acting). These five core capacities are taught iteratively using a modular approach (see Table 3). Whilst we kept the same modular approach, the content of each module was further developed to address current gaps in sustainability research, practice, and education.

Table 3: Overview of the Course's Logical Steps and Learning Objectives

	KNOWING (LECTURE)	BEING (EXPERIENCE)	ACTING

			(SKILLS)
LOVE	•Understand how modern concepts of 'Nature' are based on a fundamentally flawed sense of separation and dualism. •Understand how this sense of separation and dualism underlies historical and current social and ecological injustices. •Develop an alternative systems view of life that views ecology as a web of inter-relationships. •Consider how this systems view could provide more equitable social and material conditions for flourishing in the face of crises.	•Cultivate a non-dual field awareness of inner and outer ecology. •Gain a vital appreciation for life and life-giving processes as sacred. •Reconnect to love as the ground for being in right relationship with others. •Cultivate a renewed sense of intimacy with nature. •Sense one's intrinsic relationships to the web of life and life processes (e.g. plants, animals, minerals, water, etc…).	•Develop skills to extend and receive care to non-humans (animals, plants, etc…). •Develop skills that center and foster reciprocity and co-creation of meaning.
SEE	•Understand the complexity of today's ecological challenges and their socio-historical-cultural-psychological roots. •Develop an intersectional analyses of sustainability issues that includes social and ecological justice lenses. •Understand sustainability from multiple perspectives and social sectors. •Learn various methods for systematically understanding the complexity and diversity of perspectives and experiences.	•Become aware of how you are situated in the urban / rural ecology around you, including the ways in which your privilege (class, race, gender), biases, etc… inform your experience. •Map place-based connections to your bioregion / community. What is the history of people's relationships to the environment in which you live? •Become aware of how your way of being in the world reproduces the underlying histories, patterns, and dynamics of unsustainability. •Experience how unsustainability shapes subjectivity (e.g. our ways of experiencing, relating, and being in the world)? •Reflect on the differential impacts, responsibilities, and experiences of those suffering from related social-ecological crises.	•Develop experience-based competencies for systems thinking.
HEAL	•Understand the physical and mental impacts of ecological crises. •Learn about habituated and automatic personal and social patterns driving unsustainability (e.g. consumerism, addictions, transgressions, burnout). •Learn how to transform unsustainable into sustainable patterns.	•Metabolize and transform negative responses to ecological trauma (e.g. denial, grief, anger) and separation from nature (e.g. psychoterratica). •Experience ourselves in compassionate relation to human and nonhuman Others. •Transform negative emotions into constructive responses to eco-crisis. •Exercises that scaffold healing from the trauma of ecological suffering.	•Practice tools for healing any fundamental rupture, separation, or disconnection to life.

ENVISION	•Understand that current archetypes, cultural assumptions, values, and systems that we take as given are socio-historically conditioned and subject to change. •Imagine many possible futures and envision futures from the standpoint of the cultural heritage, values, systems etc… that one aspires to express. •Understand the baseline criteria for a sustainable, ecological civilization and become familiar with sustainable alternatives that meet these criteria.	•Practice dialogical, reflective, and arts-based exercises that express the aesthetics of sustainable futures. •Narrative storytelling exercises.	•Develop a short, medium, and long-term perspective on change. •Cultivating positive potentials in the midst of suffering.
ACT	•Understand current movements and just strategies that support the movement to sustainability. •Understand our individual roles and circle of influence. What relationships (dis)empower our capacity to affect change? •Assess strategic leverage points for taking action toward sustainability.	•Explore our unique personal capacities to affect transformation based on our skills, experiences, talents, privileges, social networks, etc...	•Develop skills to align sustainable values and attitudes with sustainable behavior. •Develop a personal and/or community strategy for change. •Build the relationships, systems, and structures that support life's flourishing. •Practice whole systems design for sustainability •Take a personal inventory and/or community assessment of your strengths/weakness and opportunities for change.

The key learning objective of the LOVE module was defined to deconstruct nature-culture dualisms and develop a systems view of life that views ecology as a web of inter-relationships. Love is foundational to the overall course, as it forms the basis of the relational approach that informed each module. Given that the field of transformative learning and sustainability education critiques the lack of relationality in mainstream education, the love module is about reclaiming relationality as a foundational principle and approach to education. Love was defined as an active stance of care. The love module taught (knowing) how a sense of

separation and dualism underlies historical and current social and ecological injustices, and how love-based activism (action) provides more equitable social and material conditions for human-Earth flourishing. In addition, contemplative practices for extending, receiving, and practicing deep self-care were used to cultivate love (being) as an active stance of care. This first module links to other research and competency frameworks for transformative skills, which have highlighted the importance of compassion and empathy for sustainability (CCCE, 2019; Glasser & Hirsh, 2016; Sterling et al., 2017; Wamsler, 2018; Wamsler et al., 2020).

The key learning objective of the SEE module was defined to develop the capacity to see the complexity and intersectionality of multiple converging crises. It considered the breakdown of ecological systems as effectuated by the breakdown of interlocking personal and social sub-systems. It identified six of the underlying systems driving eco-crisis—capitalism, anthropocentrism, patriarchy, militarism, colonialism, and white supremacy. Students were taught to understanding (knowing) their intimate relations to eco-crisis by considering the mundane ways they communicate, the values they have, and the daily choices they make within such systemic contexts. Contemplative and somatic practices (being and acting) helped participants to explore their coping and protective strategies under stress. By becoming more aware of their stress responses, they developed an increasing capacity to tolerate complexity and also to respond to and address systems of domination and oppression that exacerbate the climate crisis in more just and sustainable ways.

The key learning objective of the HEAL module was defined to facilitate restorative and reparative processes internally, between communities, and with our world. Part of this involves helping people heal from the pain and trauma of the eco-crisis. It also includes helping people

understand (knowing) that healing will also require restoration of land, redistribution of resources, and protections for communities most affected by sustainability crises. Contemplative practices (being) were used to introduce participants to collective approaches for healing grief. Healing was also presented as requiring not just personal work, but also social and political responses creating shifts in ourselves and societies. The module thus not only encouraged stopping harm at its source, but also encouraged participants to cultivate regenerative, care-based relationships and care-based systems (acting).

The key learning objective of the ENVISION module was to inspire new narratives that imagine viable pathways toward a socially just and sustainable future. Plausible futures arise out of a combination of the past, present, and future. Students were taught several archetypal ways to understand the future (i.e. evolutionary progress, social collapse, Gaia, globalism, and retro-futurism). Climate fiction (or cli-fi) was presented as a genre of speculative fiction in order to illustrate and reflect about visions of the future impacted by climate change. Participants learned (knowing) about alternative visions of the future, emerging in speculative fiction sub-genres like the new weird, solarpunk, indigenous futurism, afrofuturism, and sinofuturism. Centering, presencing, and visioning practices were used to deepen participants experiences of climate-related suffering (being), and the possibility for deeply transformative action (acting). The second, third and fourth module link to research and competency frameworks for transformative skills, which have highlighted the importance of openness, self-awareness, self-reflection and perspective-seeking for sustainability (e.g. Glasser & Hirsh, 2016; Sterling et al., 2017; Wamsler et al., 2020; CCCE, 2019).

The key learning objective of the ACT module was to describe, assess, and move to implement strategies for a just transition. Students were introduced to three logics of transformation: reform, resist, and build alternatives (cf. chapter 4 in this dissertation). They learned (knowing) how sustainability is practiced via lifestyle changes, spiritual and community preparations, socio-technical transitions, and social and environmental movements. Such transformative practices were also discussed in the context of strategies for systems change. Six important political trends were introduced: eco-socialism, eco-civilization, social anarchism, the commons, degrowth, and buen vivir. Contemplative and reflective practices (being) were used to take stock of participants current spiritual and practical approaches to climate preparedness and systems change. Students concluded by considering how the communities they engage with can meaningfully contribute to a just transition (acting). The last module links to research and competency frameworks for transformative skills, which have highlighted the importance of agency, sense-making and values-based engagement for sustainability (e.g. CCCE, 2019; Glasser & Hirsh, 2016; Sterling et al., 2017; Wamsler et al., 2020).

The diagnostic logic that informs Courage of Care's theory of change was useful for the course development as it is applicable and relevant across contexts. The five-module structure allowed participants to understand the relational nature of eco-crisis (LOVE), its roots (SEE), how to address them (HEAL), what alternatives to create (ENVISION), and what pathways can guide transformation (ACT). Within the five modules, the content and practices were further developed based on the relational modes of knowing (epistemology), being (ontology) and acting (ethics) identified in chapter 1 as relevant to the context of sustainability.

The greatest challenge of the curriculum development process (results phase I) was to develop the curriculum in a way that addressed the diverse knowledge and needs of different participants. Sustainability practitioners less familiar with certain sustainability dimensions (personal, societal, ecological) and contemplative and relational practices often needed more support processing their experiences (being) and aligning them with their practice (acting); whereas contemplative practitioners often needed more support understanding the complexity of the eco-crisis and aligning this understanding (knowing) with their practice (acting).

Future iterations of the curriculum could better meet participants' needs if different versions were developed to scaffold learning according to specific developmental trajectories. However, for the next phase it was decided to keep a balance that was seen as adequate for a broad audience.

2.4 Results Phase II and III

The second and third phases focused on prototyping and implementing the course in order to assess the impact of using a relational, justice-oriented approach on transformative learning towards sustainability. Through the participatory observation, group discussions and survey, we could identify what helped the participants to understand and experience relationality (Section 2.4.1) and social justice (Section 2.4.2).

2.4.1 Relationality

In sum, the aspects that helped participants most to understand and experience relationality through the course's content and design were related to issues of: (1) embodied learning, (2) human-nature connectedness, (3) place-based learning, and (4) handling uncertainty.

Embodied Learning: Most participants highlighted the importance of linking the provision of information and facts with embodied approaches and practices. In fact, each module started out with a lecture, followed by individual contemplative and somatic practices and reflective group exercises. In this way, knowledge coming from sustainability science, psychology, philosophy, and transformation theories was integrated using embodied practices. Contemplative practices that were particularly relevant included compassionate presence to feelings, arts-based practices, and the three modes of care (extending care, receiving care, and deep self-care). The three modes of care are derived from the relational model of compassion, also known as sustainable compassion training, that Courage of Care utilizes in its approach (Condon & Makransky, 2019; Lavelle, 2017).

In order to experience relationality, the participants validated research that states that reconnecting to oneself, others and the environment requires not just a cognitive, but also an embodied shift. Embodied cognition suggests that the body is often disregarded as an integral part of knowledge generation, especially in higher education (Eaton et al, 2016). This is unfortunate as the separation of mind and body is also said to be one important reason for unsustainable behavior (Eaton et al, 2016). Transformation thus requires one not only to think differently, and is hence not merely an epistemological process, but as noted in chapter 1, also an ontological and ethical process.

The results also showed that experiencing relationality may feel unfamiliar and challenging for course participants. One might not only struggle to develop related emotions, but also to communicate relationality, given that so much of our world is experienced in siloes. As

Lakoff (2008) notes, our language determines how we think and feel and is embedded in current cultures and structures. One participant for example asked:

> How can I use this knowledge within my work environment, especially if it is dominated by a corporate culture?

Such difficulties illustrate the need for embodying and teaching new ways of being (and their linkages to societal and ecological transformation) as a part of transformative education (Daloz, 2004; Kollmuss & Agyeman, 2002; Lange, 2004). A participant noted, for instance:

> It was very new to me to do these kinds of practices, but to me, this was the most important [part] during the workshop.

Another participant said:

> So many of the practices were beneficial and helped to create a deep context of trust and intimacy.

Human-nature connectedness: The course supported in-depth reflections regarding human-nature connectedness. These included a collective meditation on the natural elements (earth, wind, water, fire) in our surroundings, their embodiment in each of the participants' physical bodies, and the inter-relation between those elements in their bodies and environments. The lectures presented information on how the systems view of life helps explain the interconnectedness of personal, social, and ecological systems, in contradistinction to dualistic views that objectify and reify nature as an entity distinct from culture. Many participants highlighted the importance of such input. As stated by one participant:

> It is not often easy to relate [personal, social, and ecological systems] generically but when I think of particular contexts then it seems much easier to relate them… I believe these intercrossings between practical and theoretical, pragmatic and spiritual and inner and outer are a good starting point for [post-dualistic conceptualizations] to emerge.

Nonetheless, although the course referenced ways "nature" was historically tied to modern dualism and was reformulated along the lines of post-dualistic conceptualizations of inner and outer ecology (Morton, 2009; Puis de la Bellacasa, 2017), group discussions revealed that some participants persistently framed nature using the language of separation. For example, participants used language such as being "in" nature, connecting "to" nature, and watching nature.

Overcoming this inner-outer binary often requires developing new language, such as used by David Abram (1996), who dissolves the dichotomy between nature and culture by referring to it as the human and *more-than-human-world*. As Bollier and Helfrich (2019) and Schaef (1987) note, overcoming the many forms of resistance to relationality in our culture requires a new language, which we are only beginning to form.

In addition, around one fourth of participants noted that when they were young, they felt more connected to the more-than-human-world and experienced less of a dichotomy. This is crucial since research shows that people who have experienced this strong connection while young are more likely in adult life to act sustainably. For example, people who grow up spending free-time in the more-than-human-world, such as green neighborhoods, at a coast, or regular visits to green spaces, are more likely to take later actions that benefit the environment, such as recycling, buying eco-friendly products, and environmental volunteering (Alcock at al., 2020). Moreover, research indicates that exposure to the more-than-human-world is of importance for physical and psychological health, increasing one's ability to concentrate, improving one's academic performance, and reducing one's stress (Faber & Kuo, 2006; Kaplan, 1995; Wells & Evans, 2003). However, the results showed that around one fourth of participants felt rather

indifferent to the more-than-human-world when they grew up. At the same time, it was reported that this changed through increased awareness while growing up. This shows, that even when not growing up with such access to green space, a shift to dissolve the dichotomy can come about through other means (including education).

One such possibility is by invoking feelings of awe— an aspect which also emerged from the course evaluation. The ability to be in awe is getting increased attention, especially in positive psychology, as it leaves one with a feeling of happiness and content (Bethelmy & Corraliza, 2019). Moreover, recent research also shows that the experience of awe leads to pro-social and pro-environment behaviors, such as changed consumption patterns (Griskevicius et al., 2010). Wang et al. (2019) for example shows that the feeling of awe increases green consumption (defined as consumption behavior aimed at conserving resources and protecting the environment). Another study shows that people who experience awe become less self-centered and more considerate of others and the broader external environment (Keltner & Haidt, 2003). More importantly, Wang et al. (2019) suggest that awe in relation to nature increases the feeling of interconnectedness, because: (1) it encourages individuals to pay more attention to others and the natural environment, (2) it makes people feel that they are no longer isolated individuals, but closely connected to other humans and non-humans, and (3) enables people to see themselves and the world from a different angle, emphasizing their participation within a larger whole.

Several statements of participants indicated how the course has helped spur feelings of awe and facilitate an associated increase in compassion to oneself, others, and the environment. For example, one participant noted:

> Connecting with other forms of life gives me a great sense of humility, which I believe is very much needed in our times of human hubris. However, when caught up in my daily life, with the habits and sometimes stressful tasks, it is easy for me to forget this constant relationship with others and nature. Therefore, I believe it is important to take time every day to remind ourselves of this connection. In that regard, the exercises around care provided in this lecture have been very helpful to me.

The feeling of awe arises when people encounter something that is beyond their current way of knowing, provoking a need to update their mental schemas (Keltner & Haidt, 2003).

Place-based learning: Another aspect that was frequently highlighted by the participants as helpful for understanding and experiencing relationality was related to context and place-based learning. These were addressed through different lectures and practices, including land acknowledgements and nature wandering practices. Participants asked permission to interact with other beings in nature, practiced sensing their inter-relatedness to other beings, and made them offerings.

Some participants noted that context is important in determining whether they feel connected with the more-than-human-world or not. Participants noted for instance that it was easy to forget the more-than-human-world in an urbanized environment and to disregard topics like climate change, if it seems invisible in their everyday environment. For example, one participant noted:

> I believe this type of mental disconnection with my surroundings contributes to blur the consequences of my actions on the environment around me. This aspect is reinforced by the fact that I personally do not directly suffer from these consequences.

This is in line with research on transformative learning approaches, which increasingly acknowledge the necessity of place-based learning, grounded in the relationship between place

and people (Lange, 2019; Pisters et al., 2019). Several studies describe the value of appreciating the cultural, historical, and traditional connections between people and natural resources (Armitage et al., 2008; Bowers, 2005). Especially, as colonialism has disconnected people from the unique cultures that emerged in specific places (Battiste et al., 2005). As such, it is especially important to engage in place-based practices to address wealth and power disparities, resulting from colonialism, and it is important to recognize the damage that has been done to the land. Williams (2018) states that a relational shift remains only partial if the relation between place and people is not acknowledged.

Handling uncertainty: The framing of the course was oriented around two futures: The Great Transition and the Great Unraveling. As discussed in the introduction of this dissertation, the challenge is to stay attuned to both truths—to help people adapt to near-term social collapse, while cultivating the positive potentials of the Great Transition (Noorgaard, 2011; Pihkala, 2018; Walsh, 2020; Lavelle & Walsh, 2019).

The difficulty of dealing with the uncertainty of both futures was apparent during the workshops. Around two thirds of the participants in the online course felt caught in between the two narratives. One third tended to see a pessimistic future as more likely, and only around 10% explicitly leaned towards a more optimistic view. Interestingly, on all sides people were aware of their tendencies to be rather optimistic or pessimistic.

Optimism can be understood as either realistic or unrealistic optimism (Peterson, 2000). Realistic optimism can be very helpful, whereas unrealistic optimism can reinforce positive delusions that create suffering. If optimism is imposed, it can also encourage negative self-reflection, denial, and dissatisfaction (Seligman, 1990). If there is no realistic hope, it is difficult

to act. Research in positive psychology shows that people need a sense of manageability to take care of things (Antonovsky, 1987).

A relational approach to transformative sustainability education might distance itself from the idea of predefined goals, outcomes, and actions, which is dominant in sustainability education. When taking actions towards sustainability, the commonplace assumption is that the environment can be controlled and managed. According to the philosopher Donna Haraway (2015) though, we always become-with. To become-with means that we are not pre-given, autonomous individuals who can act upon the environment. Instead, we act and emerge with it. Our own agency emerges through the intra-action with other beings, forces, and matter. Nothing exists outside of or prior to its relations with others and agency is not possessed by a single entity, but emerges through relationships (Barad, 2007; Haraway, 2015). Hence, concrete outcomes for action cannot be predefined, but rather emerge (Verlie, 2018).

As a lot of the participants were either pessimistic or oscillated in between optimism and pessimism, it seems important to include further exercises to evoke feelings of manageability. This might include linking education more to active engagement and to a practice of change, as research suggests that people that do take action often feel more empowered and less overwhelmed (Sharma, 2017; Stoknes, 2015).

2.4.2 Social Justice

In sum, the aspects that helped participants to understand and experience social justice through the course's content and design were related to issues of: 1) intersectionality and 2) communities of practice.

Intersectionality. Several participants shared how their understanding and experience with sustainability was shaped by intersectionality. Intersectionality, first popularized by Crenshaw (1989), reveals how individuals and groups relate differently based on their positionality. One's relation to climate change, for example, may differ due to their positionality within power structures, based on context-specific and dynamic social categorisations (Kaijser & Kronsell, 2014). One participant from Ghana for instance described how she grew up within a country with a high level of poverty and activities, like illegal mining, in which:

> Forests are cleared and lost, waterbodies are destroyed with chemicals, and livelihood is eventually lost in the quest to survive.

She acknowledged the intersectional nature of the problem, as it is

> Related to the history and international politics of her home country.

Moreover, participants reflected on how intersectionality could help inform their studies. One student, for example, wrote her final term paper on the topic of how intersectionality informed the participants' perspective and future work. As Boström et al. (2018) note, in academia, learning is still primarily taking place within disciplinary boundaries and often lacks intersectional perspectives. However, intersectionality can help people become more comfortable with "otherness" (O'Sullivan & Taylor, 2004), it can support epistemological justice, and it is especially relevant for addressing justice issues and for ensuring the adaptability of societies (Swanson et al., 2010).

Transformative learning is still in an experimental and exploratory phase and therefore benefits from including various forms of knowledge without evaluating one form of knowing

over the other (Lange, 2019). In order to foster epistemological justice, multiple perspectives can be explicitly invited into the classroom, for example through audio and visual media.

The content of the curriculum, for instance, intentionally centered marginalized perspectives by exploring alternative speculative fiction sub-genres like afrofuturism, sinofuturism, and indigenous futurism, which was appreciated by the students. Moreover, the course used intersectional methods to present the eco-crisis as a byproduct of interlocking systems of oppression and domination, in line with Freirian approaches to pedagogy and justice (Freire, 1993).

Epistemological diversity was further supported through the course by positioning the teacher as a co-learner who acknowledges the experience and knowledge of each of the participants. Each person was acknowledged as having something to contribute, rather than presuming that one person (the teacher) has all the answers. This aligns with Lange's suggestion to position the teacher more as a co-learner to flatten hierarchies and to allow for experiences of democracy in transformative education (Lange, 2004).

Communities of practice. In order to move toward action, participants pointed out repeatedly that they enjoyed and appreciated having a group of supportive and like-minded people to learn and practice with. The feedback showed that most participants work mostly by themselves and often feel alone with their concerns, thoughts, and ideas. There was common agreement that relationships were formed through the curriculum. As one participant noted:

Real relationships were formed that will lead to action and collaboration.

Participants also noted, that due to the trust that was formed within the group, they felt safe to articulate concerns and be themselves.

The importance of communities of practice (CoPs) is increasingly acknowledged in the sustainability discourse as well as within the field of transformative learning (Murray & Salter, 2014). CoPs are based on the work of Wenger et al. (2002) and defined as "a group of people who share a concern, a set of problems, or a passion about a topic and who deepen their knowledge and expertise in this area by interacting on an ongoing basis" (Murray & Salter, 2014, p. 4). CoPs are shown to be especially relevant to sustain change in the long-term (Bradbury & Middlemiss, 2014). This is also important in order to approach interlocking crises from multiple perspectives, as CoPs can help us notice and tend to blind spots (Patten, 2018).

2.5 Conclusions

The purpose of this case study was to increase knowledge on how transformative learning towards sustainability can be fostered by using a relational, justice-oriented approach. Despite recent advancements in transformative education towards sustainability, current practices have not fully taken advantage of the potential of relational ways of knowing, being and acting (Lange, 2018; Walsh et al., 2020). The EcoJustice Course demonstrates possible pathways as to how this could be done. The lessons learned from its development and implementation show that embracing a relational and justice-oriented approach is possible and that it can support the important emotional, cognitive, and relational competencies needed for linking personal, societal, and ecological transformations. They influence embodied learning, human-nature-connectedness, sense of place, intersectionality, the handling of uncertainty, as well as communities of practice. The identified competencies and associated impacts provide important input for further

developing competence-based approaches to education for sustainability, which are often limited by some of its failures to represent their transformative aspects (Glasser & Hirsh, 2016; Sterling et al., 2017; Wamsler et al., 2020).

Putting these different features into practice can be a challenging endeavor, especially in traditional, bureaucratic educational structures.[12] It requires surpassing the limits of cognitive learning using emotional and experience-based learning methods that link theory and practice to foster sustained behavioral changes (Fugate et al, 2018). It also requires acknowledging that people of different social and cultural backgrounds have very different access points to this type of pedagogy. Experimental approaches such as the one taken in this case study show potential pathways forward. As Lange (2004) suggests, we are all learners in this. Teachers and facilitators should acknowledge that they are co-learners to promote the autonomy of students and encourage them to explore the ways they are related to other humans and non-humans. Although there is a broad spectrum of potential learning outcomes within transformative education, they are often aimed at cognitive and non-cognitive changes enabling transformative actions.

However, relational, justice-oriented approaches should not be bound to specific outcomes, as effective outcomes towards sustainability are always emergent. Supporting the emergence of new approaches and solutions, it seems particularly important to implement courses that also support communities of practice through associated structures (such as online networks, forums, continuous face-to-face or online encounters).

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[12] During Phase III, the presented course was included into existing structures. For related discussions on how educators can develop strategies to deal with traditional and bureaucratic education structures to achieve change, please see Wamsler (2020).

This case study provides important insights for further investigating the potential advantages and obstacles of a relational, justice-oriented approach to transformative sustainability education. Although relational approaches are increasingly acknowledged as a critical component towards sustainability, it is important to critically consider how they may be used to encourage sustainable transformations (Walsh et al., 2020).

These results present a concrete process, methodology and practices, together with supportive features that can support the development of related training programs and courses. The practices and features identified have been used within education previously, yet this case study shows the possibility of linking them to relational approaches and social justice issues, offering promising pathways for further developing transformative education for sustainability that other universities and training institutions could follow or learn from. The revision of the course in phase IV provides just one example of how such courses can be adapted to meet the needs of different audiences.

Chapter 3 The Transition to a Post-capitalist Commons-based Economy within a Relational Paradigm

3.1 The Emergence of Postcapitalism

In recent years, a growing number of reasons support the view that the end of capitalism, as we have lived it, is around the corner. The current late-stage capitalism is evolving the seed forms for postcapitalism at the same time as the ongoing financialization of the economy portends, as Marx predicted, the acceleration and deepening of capitalism's contradictions. André Gorz (2010) argues, "The exit from capitalism will happen… one way or another, either in a civilized or barbarous fashion." The likelihood of realizing a Great Transition therefore depends primarily on our capacity to discern the trends and practices that herald its possibility—to describe the political and economic conditions under which a sustainable future is possible. Discerning the active forces in the present that lead to a more liberative future has always been the work of historical materialists. As Walter Benjamin (2008) said, to see "the work of the past as still uncompleted… Every epoch… not only dreams the one to follow but, in dreaming, precipitates its awakening" (p. 109). Once the existing mode of production has been thoroughly demystified and denaturalized, one can begin to understand the dialectical processes currently at work and map the potentials for their successors— post-capitalism.

There are already emergent alternatives to capitalism, as the Next System project makes abundantly clear (Speth, 2016; Speth & Courrier, 2020). Post-capitalism names a reality which already exists, but which is little recognized by current thinking beholden to business-as-usual.

As with the end of feudalism five-hundred years ago, the emergence of a new world system is occurring in the cracks of the old, in the spaces where capitalism cannot contain new non-capitalist forms of ownership, funding, decision-making, communication, and subjectivity. Post-capitalism has become the subject of much recent debate in political economy, spurred by notable publications by Jeremy Rifkin (2015), Paul Mason (2015), J. K. Gibson-Graham (2006), Left Accelerationists like Nick Srnicek and Alex Williams (2015), and members of the Peer-to-Peer (P2P) and Degrowth communities. Whereas anti-capitalist politics generally follows an oppositional logic of resistance, post-capitalist politics redeploys existing infrastructure for activist causes. As Srnicek and Williams (2013) argue, "the material platform of neoliberalism does not need to be destroyed. It needs to be repurposed towards common ends."

A detailed exploration of post-capitalism, the important differences between its major proponents, and its various critiques is beyond the scope of this chapter (e.g., Pettifor, 2015; Lewis & Bell, 2015; Kay, 2015; Loeb, 2015). Though there is not uniform agreement among its proponents, post-capitalism indexes an abiding concern with transitional pathways toward an alternative political economy. It generally describes building alternatives to capitalism within the existing system using technologies, business models, and forms of social organization focused on prefiguring the alternative.

The concept's multivalence indicates that post-capitalism merely characterizes a possibility space, affording opportunities for both openings and closures. Though pregnant with potential, the same material and social technologies harbor opportunities for capitalism's restructuring as much as they signify the potential for an alternative to supersede it. Utopian and dystopian possibilities compete side-by-side (Berger, 2015). The most likely outcome will probably lie somewhere between today's imagined utopias and dystopias.

There currently exist vast new technologies capable of disrupting or alternatively restructuring material production and social relations, including artificial intelligence and machine learning, robotics, nanotechnology, the internet of things, 3D printing, blockchain, biotechnology, and smart systems. There also exist novel ways to reorganize society, including emergent anti-proprietary and gift culture movements, the collaborative commons, guaranteed basic income, worker cooperatives, community land trusts, decentralized renewable energy, DIY and hacker culture, happiness economics, the circular economy, bioregionalism, ecovillages, and permaculture. The fact that these new technologies and forms of social organization co-emerge, however, does not ensure a successful Great Transition. Instead, they only create its conditions of possibility.

For example, there is evidence that many of the latest advances just mentioned have already been coopted and contributed to the restructuring of capitalism. Algorithms and artificial intelligence have vastly improved our ability to process information and manage complex systems, but they have also facilitated greater abuses of power, systemic biases, and a loss of personal agency and democracy. Likewise, automation can dramatically improve efficiency, but also expand growth, deepen inequality, and create large-scale unemployment, so the degree to which automation will provide net benefits is highly dependent on the degree to which its benefits are socialized. In the case of the sharing or gig economy, for example, the digital revolution has only reinforced capitalist social relations, creating platform capitalism and a new class of precarious workers in its wake (Srnicek, 2016). Yet, the same digital technologies could shift social relations. Smart is a good example of a platform cooperative that mutualizes risk for

freelance workers in nine different countries.[13] Distributed cooperative organizations (DisCOs) like the Guerilla Media Collective are even more radical, using blockchain technology to organize on the basis of non-capitalist relations (Troncoso & Utratel, n.d.).

Realizing a Great Transition will depend on the capacity for new technologies to shift social relations and alter the balance of political and economic power. The technological advancements of the Fourth Industrial Revolution combined with new forms of radical democracy offer a means to make the economy much more effective, but only if they are guided by the public interest over personal profit. These technologies must be ethically designed and employed with greater transparency, accountability, and sensitivity to democratic processes to take advantage of their vast potential to improve society.

At the very least, greater regulation and oversight of the development and implementation of these technologies is needed to ensure they are accountable to the public interest. Regulatory capture remains a high risk, however. In ideal scenarios, these technologies would be more democratically designed and used as digital commons, as they offer immense potential for improving the efficiency and scalability of decentralized planning and economic democracy. Such potential is lost, however, if private or public corporations dictate their development and use outside democratic controls. The movement for data sovereignty can help democratize technology and ensure tech justice, so technologies' benefits are equitably distributed, rather than centralized or controlled by individuals (Kukutai & Taylor, 2016).

Emerging political movements indicate there is already a struggle underway. In the last few years, the world has witnessed a surge of anti-austerity, left-wing populism, and anti-capitalist movements responding to the crisis of neoliberalism. Examples include the Occupy

[13] https://smart.coop/

movement, the indignados, Rojava's experimentation with stateless democracy, the Democracy in Europe Movement 2025 (DiEM25), the Nuit Debout movement in France and the electoral manifestations of these movements with Syriza and Popular Unity in Greece, Podemos in Spain, the Pirate party in Sweden and Iceland, the Left and Workers' Front in Argentina, Jeremy Corbyn in Britain, and Bernie Sanders in the U.S. Each of these movements exploits the new technical infrastructure to launch programs of resistance and attempts to prefigure new models of social reproduction which are less dependent on capitalism to varying degrees.

To focus on just one example in the U.S., the Bernie Sanders campaign demonstrated that the American public was willing to debate systems change in mainstream media for the first time in recent memory (Nichols, 2015; Sanders' strength?, 2015). Sanders garnered massive grassroots support following a democratic socialist platform that sought to repoliticize the economy, extend democracy to the workplace, create new forms of participatory democracy, and limit the influence of a professional political class. He also represented the strongest position on climate legislation in the Senate (Adler, 2015), and defended many of post-capitalism's basic proposals, including guaranteed basic income and worker-owned cooperatives (Santens, 2016; Worker-owned businesses, 2014). Though his presidential campaign ultimately failed, it generated new political organizations that continue to amass popular support for his agenda.[14]

Though Bernie's campaign cannot be equated with the aforementioned political movements, they share common aspects that are mutually reinforcing and indicative of a broader movement toward post-capitalism. In most cases, each was supported by a more decentralized model of social organizing that combined both social media and off-line organizing. Bernie

[14] See, Our Revolution, https://ourrevolution.com/; Brand New Congress, https://brandnewcongress.org/; Justice Democrats, https://justicedemocrats.com/.

Sanders, for instance, could not have gained prominence without the technical capacity to crowdsource his campaign, both through public funding via online contributions and grassroots political organizing. Globally, social movements have likewise evolved by incorporating social media and open-source technology, allowing for direct actions to be spontaneously organized and modified in real-time, so that they strategically adapt to changing conditions and constraints (Franco, Loewe, & Unzueta, 2015). While this new technical infrastructure has enhanced public participation in new political movements that contest capitalism, it has also created new social relations that model alternative futures (Buckland, 2016).

3.2 Requirements of a Great Transition: Drawdown, Degrowth, and Basic Abundance

There are three non-negotiable requirements of postcapitalism for it to align with a Great Transition: drawdown, degrowth, and basic abundance.

First, global warming should not rise 1.5-2 °C above pre-industrial levels to ensure the stability of the Earth system. According to the "Hothouse Earth" scenario, runaway climate change kicks in at around this level (Steffen et al., 2018). Past this level, the cascading effects of crossing known tipping points will push the Earth system into an unstable state from which we cannot return. Further warming will become self-sustaining.

Current IPCC scenarios project that to stabilize the climate at 1.5-2 °C, we must reach global net zero carbon emissions by 2050. Practically, this means that carbon emissions must decline 7 percent per year for 30 years. Historically, such a reduction in emissions has only been experienced during massive socioeconomic crisis, such as World War II and the collapse of

communism (Otto et al., 2020). Worse still, the IPCC analysis is inherently conservative, as its models do not incorporate nonlinear climate tipping points and they assume that new technologies will be developed and rapidly scaled to sequester massive amounts of carbon. More likely than not, we have already committed to go beyond 1.5 °C, and to stay within 2 °C, we will actually need to reach global net zero emissions by 2030 (Breakthrough, 2021).

The scale and pace of such changes implies a massive implosion of the carbon economy. The Stern Review on The Economics of Climate Change (2006) claims that reducing emissions by more than 1 percent annually would generate a severe economic crisis. The stability of capitalism depends on growth; so, the only politically palatable solution is to grow the economy without incurring environmental impact. Proponents of "green growth" believe that growth can be sufficiently decoupled from environmental impacts. Although there is some evidence of relative decoupling, there is no empirical evidence for absolute decoupling, which is in fact what is needed (European Environmental Bureau, 2019).

> At the global level, sufficient absolute decoupling to prevent climate breakdown would require an average annual decline in the carbon intensity of global economic output of around 14% every year for the next three decades. The highest rate of decoupling ever achieved by the world's advanced economies was a little under 3%, in the years immediately following the oil crises of the 1970s. (Jackson & Victor, 2019, pp. 950–951).

Although technological advancements improve efficiency, they do not substantially reduce resource use; on the contrary, efficiency gains from technology usually increase the absolute amount of energy consumed, following Jevons Paradox (Fletcher & Rammelt, 2017). Furthermore, technological interventions that enhance overall efficiency end up adding to global inequality and ecological overshoot, insofar as they accelerate growth. Growth and energy are

directly correlated (Garrett et al., 2020), and growth is one of the chief drivers of both social inequality and environmental degradation.

The Kuznets curve shows that environmental impacts are typically reduced after a country has developed enough to outsource its heavy industry and manufacturing (Haberl et al., 2020). On the global scale, there is no feasible way to achieve absolute decoupling. Greening capitalism can reduce the ecological costs per unit of production and increase efficiency, but nevertheless, owing to capitalism's structural dependence on growth, it cannot resolve its ecological contradictions.

This does not mean that capitalism must be entirely eliminated to achieve sustainability, but it does mean that other non-capitalist systems (e.g. eco-socialism and eco-anarchism) must predominate in the future. Unlike all 222 IPCC scenarios which assume sustained growth and rely on unproven assumptions about technology and decoupling to compensate, degrowth scenarios are the only historically proven pathways to limit warming below 1.5-2 °C. (Keyßer & Lenzen, 2021). Degrowth is a practical necessity to sustain civilization, and as such, we must focus on constructing alternative lifestyles and social structures that can manage our descent and regenerate the environment.

The degrowth community is a heterogenous field of scholar-activists mapping the transition to a society that flourishes outside the industrial growth paradigm. Contrary to common misunderstandings, degrowth does not mean negative growth or imply sacrifices to one’s quality of life. Rather, it is focused on reducing a society’s material and energy throughput while actually enhancing quality of life (Kallis, 2018). Today, progress is largely defined in terms of increases in productivity and the growth of the economy using measures like the Gross

Domestic Product (GDP). Happiness economics demonstrates, however, that economic growth does not necessarily reflect improvements in well-being. The Genuine Progress Indicator shows that the social and environmental costs of endless growth have in fact severely impaired progress (Fox & Erickson, 2020).

Growth that decreases quality of life is called uneconomic growth. Like organisms, systems convert matter-energy to sustain their own life and expel waste into the environment. The long-term vitality of any system depends on maintaining a healthy balance between the system's need to consume (to sustain itself) and the environment's need to regenerate (to replace what was consumed and metabolize what was deposited as waste). The relationship between these two can be expressed in terms of metabolism— as an exchange of matter-energy between the system and its environment. At its core, sustainability is an outcome of healthy metabolic relationships between an organism and its environment.

When consumption depletes resources faster than their rate of regeneration— which is what we are currently doing— it is by definition unsustainable. The global economy already consumes far more material resources and pollutes more toxic chemicals than the Earth system can sustainably regenerate, sequester, or process. We have been in "ecological overshoot" since 1970 (Global Footprint Network, n.d.), and as the Club of Rome predicted in 1972, we have surpassed the limits to growth, and there is no chance that a wildly optimistic techno-future can sustain growth beyond ecological limits (Herrington, 2020; Meadows et al., 1972).

Civilization will either collapse or it will follow a path of managed descent and sustainable reorganization. Even if we succeed in rapidly divesting from fossil fuels and transition to renewable energy on a global scale in the time needed to limit warming below 2 °C,

the new renewable infrastructure will not be able to meet the energy needs of our high consumption, high-tech global civilization built with hydrocarbons (Hall et al., 2014; Michaux, 2019). That is because renewable energies have a much lower energy return on investment (EROI) than fossil fuels, especially when you factor in the embedded energy (energy) of renewables and the costs of building a global alternative energy infrastructure with the necessary storage capacity to provide reliable coverage and service (Seibert & Rees, 2021). Since we cannot sustain the socio-political complexity of today's hydrocarbon civilization, we must therefore find ways to effectively reorganize society around sufficiency and carefully manage the reduction in energy and complexity to avoid high-risk factors (social unrest, migration, war) during the transition.

To do this, we must eliminate fossil fuel subsidies, engage in society-wide divestment and fossil fuel resistance, and transition to renewable energy, while at the same time, we must decrease our consumption, downscale the size of the global economy, and democratically reorient it to provide for people's basic needs within ecological constraints. None of these actions are optional. Today’s most progressive reforms, including the Green New Deal and the circular economy, will only be truly sustainable if combined with a more equitable distribution of resources and decreasing per capita consumption in advanced economies. When mainstream approaches to sustainability fail to challenge capitalism and the growth imperative, they provide limited, even false solutions to today’s crises. For sustainability efforts to be truly effective, they must be part of a comprehensive degrowth agenda focused on systems change.

The goal of degrowth and the objective requirement for achieving long-term sustainability is to ensure that the global economy reaches a steady state, meaning that it

balances its need to consume energy and materials with the Earth's capacity to regenerate them. The economic system should exist in a state of dynamic equilibrium with the environment. This does not imply homeostasis. It rather implies that there is an ongoing fluid exchange of matter-energy between the system and its environment which can be indefinitely sustained, even as it continues evolving.

To reach a steady state below 2 °C and to do this equitably demands that countries pay their fair share to offset their historic emissions (Athanasiou et al., 2014). Economies which already overshoot the limits to growth should adopt degrowth and help finance sustainability transitions in developing economies. High consuming countries in the Global North need to reduce average per capita income 4 times at a yearly pace of -3% until 2050, while countries in the Global South should increase their GDP per capita threefold. Similarly, Global North countries should reduce their current energy consumption at a pace of -3% per year until 2050 while Global South countries should increase their consumption by 30%. Global North and South would then meet at a global convergence range of 50–60 GJ/12,000 US$ per capita (Capellán-Pérez et al., 2015). As tremendously difficult as this would be to achieve, such rates would need to be even more aggressive if, as mentioned before, the carbon budget is significantly less than the IPCC's more conservative estimates suggest, such that staying below 2 °C would require achieving global net zero by 2030 (rather than 2050).

The convergence range is within the bounds of providing basic abundance, since countries currently in the convergence range display levels of Human Development Index (HDI) close to the UN "high development" threshold (HDI greater or equal to .8). There is a decoupling between income and wellbeing at this convergence range, illustrating that everyone's needs can

be met, and there may even be the potential to increase wellbeing if economies in this range optimize for sufficiency and quality of life, rather than growth and consumption (Capellán-Pérez et al., 2015).

Although degrowth is beginning to enter mainstream debate, especially in Europe, it has very little influence over public policy, so it is hard to see how anywhere near the required reductions would be achieved. Few politicians are willing to challenge the growth imperative that sustains the global capitalist system. This contradiction lies at the heart of our inability to respond to the ecological crisis. The imperative to grow the economy beyond the limits to growth and the impossibility of absolute decoupling of growth and environmental impact creates an ecological crisis which capitalism cannot resolve. The denial, delay, and relative inaction we currently see illustrates that the transformation required far exceeds any politically feasible solution within the current capitalist economy.

Likewise, capitalism cannot solve inequality. Charity and redistribution only reduce inequality. They do not transform how inequality is structurally generated through capitalism's class-based structure of private ownership (Aschoff, 2015; Giridharadas, 2018). Under capitalism, the rate of profit exceeds the rate of compensation, so the system is structurally designed to produce inequality between capitalists and the working class. As capitalism was globally exported, those countries that have benefited the most from imperialism and colonialism have also had greater power within the world system both to exchange goods and services and to shape trade agreements to their advantage. Ecologically unequal exchange (EUE) illustrates how those who are economically and socially disadvantaged also experience environmental inequality and environmental racism to a much greater degree (Meynen, 2016). Attempts by the IMF and

World Bank to serve those marginalized within the world system have in fact perpetuated unequal exchange by globally extending the debt-based monetary and financial system and by forcing countries to pay back debts by transforming commons and collectively owned enterprises into privately owned enterprises through structural adjustment programs (Basu, 2019; Escobar, 2011). Since the class structure of capitalism generates inequality, achieving equity at a large scale also requires a transition to postcapitalism that emphasizes democratic forms of ownership, management, exchange, and finance.

3.3 The Shift to a Commons Paradigm

Fortunately, democratic and systemic alternatives to capitalism already exist. In his essay, "Commons in the Pluriverse," Arturo Escobar (2015) argues that the practice of commoning makes many worlds possible within the One-World World of global industrial capitalism. The commons movement constitutes an ontological multiplicity— a pluriverse— of systemic alternatives contesting the capture of value by global markets and nation states. Many people disregard the potential of existing commoning practices because they tend to focus on capitalism as their core referent for diagnosing today's problems and proposing solutions. J.K. Gibson-Graham (1996) calls this tendency "capitalocentrism." The diverse economies research program developed by Gibson-Graham (2008; 2014) and colleagues provides hundreds of examples of postcapitalist, commons-based economies.

Commons describe democratically owned and managed resources. They operate outside the market and state, presenting alternative economic arrangements defined by communities. Since communities define the guidelines and incentives for guiding their own economic behavior, people are afforded more agency and responsibility for self-governance. Commons can be

material (in the case of air, water, and soil) or immaterial (in the case of open-source software, open-access libraries, cultural heritage, care work, and free education). They include traditional natural resource commons, social commons, digital commons, urban commons, and productive commons (Bauwens & Niaros, 2016, p. 17).

It should not be surprising that the reemergence of the commons provides a solution to the dual crises of inequality and climate change, considering that both are the result of capitalism's take-over and despoiling of the commons. The enclosure of the commons was one of the primary historical conditions that generated capitalism and gross inequality (Linebaugh, 2014; Shiva, 2005). From the 17th to 20th centuries, the British government passed over 5,000 enclosure acts that extended the system of private ownership across society (Fairlie, 2009). Land which was formerly held in the commons began to be claimed as property, dispossessing people in the countryside from their means of subsistence. Social hierarchies became reconfigured. A new working class was established as rural populations were forced to migrate to cities to sell their labor for wages; meanwhile, those who owned land made profits from surplus production and passed land on to succeeding generations, creating systems of inherited wealth that drive inequality to this day.

Climate change, on the other hand, is a classic example of the tragedy of the commons. In 1968, Garrett Hardin wrote a famous essay called "The Tragedy of the Commons," in which he argued that individuals pursuing their self-interest would despoil the commons unless the state or market intervened to regulate them. In the last fifty years since his essay was published, we have witnessed to the contrary how increasing privatization and poor state regulation, rather than helping to manage the commons, have laid waste to it.

Neoliberalism's privatization of public goods has extended the tragedy of the commons from the domain of common resources (like air, water, and soil) to that of social provisions (like health care and education) and finally to our social interactions and inner lives (via the profusion of corporate-owned digital technologies, social media, and advertising). Climate change is a *consequence* of the privatization and mismanagement of the commons by capitalism and the state, not an excuse to privatize and regulate it even more, as Hardin claimed.

Climate change and gross inequality pose fundamental challenges to market and state systems, some of which will collapse over the next few decades. Commoning can provide a generalized solution to the systemic crises of the 21st century. Commoning is a tried-and-true way to sustain economic well-being during periods of systemic crisis. The two dominant features in historical societal collapses— over-exploitation of natural resources and strong economic stratification—can be avoided through commoning (Motesharrei et al., 2014). According to Bollier, "As the grand, centralized market/state systems of the 20th century begin to implode through their own dysfunctionality, the commons will more swiftly step into the breach by offering more local, convivial and trusted systems of survival" (Broumas & Tarinski, 2017). Already, there is evidence of this happening.

The recent explosion of commons-based economics has emerged in response to systemic crises (e.g. Lerch, 2017). The commons is spreading rapidly among communities hit hardest by recent financial crises and the failures of austerity policies. In response to the failures of the state and market, many crises-stricken areas, especially in Europe and South America, have developed solidarity economies to self-manage resources, thus insulating themselves from systemic shocks

in the future. Responses to the COVID crisis have been marked by widespread commoning, especially through mutual aid. We may already be witnessing the shift to a commons paradigm.

Commons-based systems provide the best systemic and adaptive response to climate change, because they can sustain flourishing while reducing material throughputs by up to 80% (Rizos & Piques, 2017). The commons provides a social form for degrowth and sustainability (Euler, 2018). There are crucial infrastructure and institutions (i.e., education, water, energy) that cannot be created anew from scratch. We cannot afford under the present ecological circumstances to create vast new industries. We need to transform existing infrastructure including large scale industry towards the commons (we need to "commonify" them).

To enhance quality of life under degrowth scenarios also requires a strong commitment to cooperation and justice. Commoning is more effective at harnessing collective intelligence and democratically allocating resources to meet everyone's needs, because its distributed architecture and design principles create multidimensional impact oriented toward the common good (cf. chapter 4). Rather than focusing on production as we do with GDP, we should be focusing on social and ecological reproduction. This is especially important as the global economy stagnates and then contracts, as social and environmental pressures mount. Sharing resources in common will be essential to provide the conditions for flourishing in a warmer world racked by instability, conflict, and growing resource constraints.

For most of human history, the practice of commoning was the default mode of production, and in most cases, it remains the default mode of social reproduction, considering how much unpaid labor, performed mostly by women and people of color, is performed via commoning. The sustained vitality of capitalism has always depended on commoning; yet it has

never recognized it as intrinsically valuable. In *The Economization of Life*, Michelle Murphy (2017) defines distributed reproduction as "the struggle for collective conditions for sustaining life and persisting over time amid life-negating structural forces." Distributed reproduction considers "what distributions of life chances and what kinds of infrastructures get reproduced" (Murphy, 2017). Given the unequal distribution of risks posed by intensifying climate change, a community's capacity to share will be crucial to its survival on a wetter, hotter, and meaner planet. Commoning offers ways of "making-livelihood" in the adverse conditions of the Anthropocene (Gibson-Graham & Miller, 2015).

If commoning becomes a widespread response to provisioning amidst the collapse of social and ecological systems in the 21st century, as the current situation suggests, then there will also be parallel shifts in people's mindsets, social norms, and behaviors. The commons is a way of life, prefiguring alternatives to capitalism as part of a larger cultural shift. What we need are cultures of practice to translate such innovations across all domains – political, economic, spiritual, and artistic.

3.4 Cultures of Commoning within a Relational Paradigm

Garrett Hardin has been widely criticized for misunderstanding how commons-based systems work. Despite being well-received by the political and economic establishment, his understanding of the commons was not based on empirical observation, but on an ideological commitment to the neoclassical view of individuals as autonomous, rational, and self-interested persons incapable of cooperation unless coerced.

Elinor Ostrom's pioneering work illustrated (contra Hardin) that the commons can be designed to encourage cooperation and prevent free riders from coopting resources. Her book *Governing the Commons* outlined eight key design principles for successfully managing commons (Ostrom, 1990). For decades, Ostrom developed a large body of scholarship devoted to empirically studying how commons are self-organized and self-regulated. Her impact was so great that in 2009, she was the first woman to win a Nobel Prize in economics. To the consternation of many mainstream economists, she showed that people self-govern the commons through effective communication, trust, and reciprocity, rather than through market or state intervention. Thanks to Ostrom's legacy, the commons are now better understood and established across many disciplines.

Over the last several decades, there has been a profound proliferation of scholarship advancing our understanding of the commons. The logic of the commons is so different from liberal democracy and market capitalism that it is necessary to rethink the premises informing it. Elinor Ostrom's institutional analysis and development framework, for example, is the dominant approach to understanding the commons, yet it takes for granted many of the same foundational assumptions of standard political and economic thought. Ostrom's pragmatic use of methodologies from institutional economics and game theory made her work appealing to the mainstream but limited its scope and relevance. The methods she employed still presumed that people were rational individuals seeking to maximize self-interest. Her methodological bias toward the individual disregarded structural and political interpretations of the commons (Wall, 2014), as explored by Marxist scholarship for example (e.g. De Angelis, 2017; Hardt & Negri, 2009; Linebaugh, 2014).

Garrett Hardin and to a lesser degree Elinor Ostrom developed their work on the commons within the current paradigm. Their understanding of commons as objects—whether material or immaterial—was implicitly informed by an ontology of substance in which commons are conceived as being constituted by rational, autonomous individuals who cooperate because of formal norms and rules prescribed to them. Developing the commons via this liberal theory of the individual, market, and state is problematic, because it reduces commons to an imposed set of procedures and regimes for managing life.

In their latest book, *Free, Fair, and Alive* (2019), Bollier and Helfrich reinterpret Ostrom's framework in a different ontological register. They suggest that commons are most aligned with process-relational ontologies. Although process-relational ontologies have become an emerging topic of interest in recent scholarship (cf. chapter 1), they have existed from time immemorial within indigenous traditions (Todd, 2016). Bollier and Helfrich expand Ostrom's eight design principles to identify 28 patterns exploring the commons across three inter-related dimensions— provisioning, peer governance, and social life. Across each of these dimensions, they coin new terms to describe patterns for enacting the commons which are vital, but which were largely missed or underexplored by mainstream governance frameworks, including the Ostrom framework.

Process-relational ontology, they argue, provides a better apparatus for explaining the complexity and diversity of the commons. Whereas prior conceptualizations view commons as objects and assume that individuals need to be regulated and punished to prevent overconsumption; a relational perspective views commons as fundamentally generated by social practices. According to this view, commons are not objects that pre-exist their creation. There

are no commons without commoners to enact them. One could say that the commons emerge co-dependently with a field of objects, forces, and passions entangling the human and nonhuman, living and non-living, organic and machinic.

Commoning is a more descriptive and helpful term insofar as it focuses on the relations and practices that generate common goods. In *Patterns of Commoning*, Bollier and Helfrich (2015) argue that all commons exceed conceptual distinctions, because they are not things; rather, they are social practices that express another way of being, thinking about, and shaping the world.

Rather than being premised on a liberal epistemology based on the individual, this perspective assumes a relational ontology and epistemology that does not dualistically separate the material and immaterial commons, the commons (as object) from the commoners (as subjects), nor does it separate humans from nonhumans. Instead, the commons are always understood as a more-than-human achievement, neither wholly produced by nature or culture. Commoning becomes, as Akomolafe (2016) points out, a material-discursive doing shaped by practices and values that engage humans with their environments.

The processes and relations investigated from a process-relational perspective extend much further and deeper than those within and among human beings. Process-relational ontologies posit that everything is co-created, constituted in and through relations to other things, human and nonhuman. We are literally in every moment of our existence co-creating one another and the world that we live in. Philosopher Andreas Weber even argues that commoning is in fact the default mode of reproduction in nature. In his essay, "Reality as Commons" (2015), he writes that "the commons describes an ontology of relations that is at the same time existential, economic and ecological (p. 371)… commoning considers the coexistence of living things on

this planet as a joint, creative process, one that increases the aliveness of the biosphere and the cultural sphere" (p. 378). Processes of emergence extend outward, mutually influencing each other to varying degrees, through complex interconnections in the web of life.

Native American traditions consider both humans and nonhuman entities as persons. The stone and the river are seen as unique persons co-creating each other, which is why prayers often end with "for all my relations." The Huayan tradition of Buddhism uses the metaphor of a jeweled net to describe the infinite complexity of a multi-causal universe. At each node of the cosmic net, there is a multifaceted jewel that reflects all the others while keeping its own unique position. When one thing arises, all things arise simultaneously. Everything in this net has mutual causality, so that what happens to one thing happens to the entire universe.

Examples of commoning vary widely according to local needs and customs. Particular commons can only be understood in their actual, embedded social and ecological circumstances, and in the subjective and emotional experience of those involved in commoning. In the Vrancea Mountains of Romania, for instance, commoners have been managing the forests since the sixteenth century. Today, 65,000 hectares of forest are managed by village assemblies providing villagers equal access and rights to the forest. Harvested wood is either used for local consumption or sold, with all profits reinvested in local infrastructure. This prevents the state, market, and local officials from using unsustainable logging practices to exploit the people and the land. For the villagers, "managing the forest is not all about calculations, performance, material value and revenues. It is also about affective relationships and symbolic meaning as reflected in collective memory, tradition and identity" (Vasile, 2015, p. 69). Escobar's (2016) concept of "thinking-feeling with the Earth" (*sentipiensan con la Tierra*) describes the ways

indigenous peoples think, without the western habit of separating the mind and body, and reason and emotion.

As a practice, commoning shapes who we become. In another forest commons in Rajasthan, India, villagers collectively tend the forest by mindfully cutting enough wood to sustain their multiple needs while ensuring the restoration of forest wealth (Soma & Audichya, 2015, p. 78). In Bolivia, the Cochabamba water committees "share the same basic commitment to water as a living being, as something divine, as the basis for mutuality and complementarity (Olivera, 2015, p.86)." Similarly, the Quechua communities in Peru design political and socioeconomic systems, called *ayllu*, to link individuals with the land, each other, and the spirit world. Their spiritual traditions and cultural values (embodied within a unique cosmovision) are integral to their cultivation techniques, barter and exchange practices, and stewardship of the agroecological region (Bollier, 2015, p. 103).

The shift to a commons paradigm is aligned with a shift toward a relational paradigm. Recent work on the epistemological, ontological, and ethical dimensions of commoning illustrates its connection to the relational epistemology, ontology, and ethics explored in chapter 1 of this dissertation (Bauwens, 2018; Blencowe, 2016; Bollier & Helfrich, 2015, 2019; Bresnihan, 2016; Doran, 2017; Escobar, 2017; Johnson-DeBaufre, Keller, & Ortega-Aponte, 2015; Kanngieser & Beuret, 2017; Kocagöz, 2015; Papadopoulos, 2012; Singh, 2017, 2018; Velicu & Garcia-Lopez, 2018; Walsh, 2018; Weber, 2013, 2017). Commoning is a practice for embodying the political and economic, ethical and aesthetic vision of an ecological and relational worldview, especially if we recognize that nearly all those peoples who still live according to relational worldviews are enacting commons.

3.5 Contemplating the More-than-Human Commons

There is a growing recognition that inner spiritual conversions that manifest themselves in different sets of values and behaviors also manifest in fundamentally altered social, political, and economic systems. Bollier and Helfrich (2019) argue that making an ontological shift, or an *OntoShift*, toward a relational paradigm offers much greater potential to transform society via the logic of the commons.

Commoning not only creates sustainable and equitable systems—it also has the potential to birth entire new lifeways and worldviews premised on relationality and reciprocity. It generates worlds where we commune with each other and with the environment, as if every object is also a subject—a being worthy of our respect. To avoid civilizational collapse, Bhikkhu Bodhi (2014) says, we need to accept a relational worldview that affirms subjectivity across all life forms and indeed the cosmos itself, so that we view everything as a subject with its own experience and intrinsic value.

From the perspective of a relational worldview, commoning is extended beyond peer-to-peer economics to practices of caring for every being. A relational worldview posits that nature is not an element separated from us but co-produced in our daily interactions. Environmental ethics that uphold irreducible wholeness and seek reintegration between humans and nature are giving way to an ethics of coming undone. Climate change can more often be immediately experienced by understanding how one's daily life is always already implicated in the co-production of unsustainable nature-cultures.

A relational worldview highlights how relationships are not only externally dependent, but internally dependent and always present to one's inner awareness. All beings are related vis-à-vis our experience of one another. Thus, the deeper we connect with our own suffering, the more we realize our suffering's constituent relation to the suffering of others and the more we act to serve others as extensions of ourselves.

Relational worldviews allow us to more intimately understand how we co-produce nature-cultures and how they may more positively address systemic socio-ecological crises. Developing an ethics of care that extends to the many differently abled, human and nonhuman, beings in the Anthropocene entails queering our notions of subjectivity and agency. This will help to answer complex questions about what it means to be human, whose lives matter, how we gift and protect human dignity, and how we envision the collective conditions of transformation toward a more convivial and hospitable world.

Commoning is a mode of relating to each other, both materially and interpersonally, through an enhanced understanding of our non-separateness, our co-dependence, and together-ness. This way of being strives toward the realization of *harmony-in-difference*. An ecology of commons "envisions dynamic solidarities and collaborations across ontologically different commons communities" (Bauwens & Ramos, 2018, p. 3). Commoners provide the conditions for each other's flourishing, emphasizing that freedom and self-determination are dependent on building richer, more intricate connections to communities of human and non-human beings, forces, and objects. The commons appear as emergent processes enacted by communities living convivially with one another to maximize life's intrinsic value wherein increasing life's value is achieved through the harmonious and ever-complexifying contrast between commoner's self-

determination and solidarity within and between communities. Life itself follows a logic of commoning insofar as it is sympoetic. Beings become with their environments; and yet there is always a transcendence of the environment in an entity's capacity for creative advance.

Well-established commons that integrate cooperatives and grassroots organizations, such as Cecosesola in Venezuela or Cooperativa Integral Catalana in Spain, provide for the needs of everyone in their diverse communities by practicing transparency, equality, and respect. Building trust and exercising responsibility are the essential ingredients that allow for successful self-management and self-organization (Bollier & Helfrich, 2015, pp. 77-82; Serra & Fernandez, 2015). As described by ubuntu,[15] I am because you are. One might understand that one's liberation is co-produced by another's liberation, as an entanglement of our worldly and spiritual fates. Expanding inclusivity becomes about enhancing everyone's freedom—not just the marginalized. And since consciousness is supported and maintained by material infrastructures and desires, material transformation and transformation of consciousness go hand-in-hand.

Though little recognized, commoning also has this dual valence as a pattern of both material and social-spiritual exchange—an exchange between individuals and communities who self-organize and take responsibility for one another. Unlike policy makers who often manage common-pool resources by policing and regulating rational self-interest, commoners themselves manage the commons out of a sense of emotional attachment to the land and community. In the fisheries off the west coast of Scotland, for example, fishermen follow "'gentlemen's agreements' that emerge out of community commitments and obligations" (Nightingale, 2015, p. 307). Likewise, the open-source and digital commons movements provide evidence of how voluntary

[15] A Nguni Bantu term meaning "humanity" that informs Southern African philosophy

exchanges enhance public access to education and resources. The global community of volunteers who share data and information on OpenStreetMap, for example, provides a wide variety of responders with the resources and information on health facilities, government buildings, and public utilities that prove essential to provide disaster relief for those in need (Chapman, 2015). In both cases, commoners are not acting out of rational self-interest, but rather are taking care of one another's needs according to a felt sense of commitment to others, human and nonhuman.

Many aspects of social and ecological crises are created by cultures of irresponsibility and unaccountability. Diverse forms of commoning may thus be viewed as appropriate responses to climate change, whether by practicing commoning through agroecology, arts and culture, digital technology, exchange and credit systems, knowledge production, or in codesigning neighborhood and urban environments. When the state and market do not offer security and refuge, we can provide it for one another; individual irresponsibility can be overcome by taking greater collective responsibility. According to this view, self-care becomes intrinsically tied to other-care, and exchanging one's self-interest for the interest of others is re-envisioned as caring for oneself in service to the community (Ikeda, 2017). Liberation will come for all of us, or none of us.

The capacity to disregard climate change is predicated on the abject neglect of those who already suffer its effects—the climate refugees, the impoverished, and the famished. Opening oneself to vulnerability and suffering is thus a political act of solidarity, because exposing oneself to injustice allows one to relinquish positions of privilege, which in turn liberates the oppressed and provides the conditions for their wellbeing.

Awakening not only means suffering this collective suffering but being compelled to compassionate action. Com-passion (lit. suffering with) in this sense is not understood exclusively as a subjective disposition—as empathic resonance. It is, as Bhikkhu Bodhi calls it, conscientious compassion, because it "gives birth to a fierce determination to uplift others, to tackle the causes of their suffering, and to establish the social, economic, and political conditions that will enable everyone to flourish and live in harmony" (Lam, 2015). Studies on virtual reality show that people who feel what life is like from the perspective of plants and animals are more motivated to behave in environmentally friendly ways (Rieland, 2016). Compassion isn't compassion unless it is embodied, enacted, and extended to others.

Taking responsibility for our active involvement in the Anthropocene also requires that we contemplate our relationship to everyday objects as if they were all-in-us. As Litfin (2016) illustrates, meditatively walking around shopping malls can catalyze greater awareness than meditating on the cushion. Not only does my consumption afford me privilege, but my privilege to consume without regard to its social and ecological consequences jeopardizes the survival and wellbeing of marginalized populations, human and nonhuman alike. The practice of contemplating the more-than-human commons is a refusal to disregard these costs.

Tracing commodity chains can be understood as a way to more deeply understand the karma of one's consumption. Whereas global capitalism thrives off abstraction, separating producers and consumers by great distances and timescales; contemplating the more-than-human commons makes the abstract concrete. By contemplating one's use of everyday items like computers and iPhones, one *sees* the histories of colonialism, racism, and environmental harm implicated in their use and production. Likewise, in contemplating climate change,

contemplative practices can make the abstract statistical analysis of typical climate communications into concrete experiences. This can help sensitize us to the civilizational upheaval afoot, so that we can move beyond denial toward realistic, morally informed action.

This is an important shift to be making, since contemplating today's injustices can allow us to recognize false promises. It would help us recognize, for instance, that green tech fixes that encourage greater consumption, that refuse to acknowledge embodied energy costs, and that distract from systemic (structural, behavioral, and cultural) changes hold out the promise of a future predicated on the impoverishment of the present. If we embody an ecological self, Habito (2015) says, then "we can experience the fact that the mountains are being denuded, the rivers are heavily polluted, [and] the great wide earth is wracked with pain." Contemplating so-called "dark" realities can help connect us to the more-than-human commons.

When we're faced with "darkness," if our impulse is to run away or eliminate it from sight rather than probing deeper and understanding it, then the culture of positivity and hope we've built becomes an ideology that squashes critical inquiry and compassionate responses to whatever it opts to disregard. Confronting injustice through contemplative practice allows us to better understand and empathize with the world, beyond our privilege, and gives us the energy to fight injustice, rather than turn a blind eye to it.

Since denial is so widespread and is promoted by our culture of knee-jerk positivity and hope, people need to be provoked by the strange, dark, and undesirable. After all, the first noble truth in Buddhism is that people have to sit with suffering. Timothy Morton's *Dark Ecology* extends this truth toward our understanding of ecology. He says, "The struggle to have solidarity with lifeforms is the struggle to include specters and spectrality… Dark ecology is… about how

do you actually coexist nonviolently with as many beings as possible" (Korody, 2016)? That is as good an aim as any when contemplating the more-than-human commons. As a society, we are by and large not facing up to the suffering of climate change, and until we do, we'll continue to place hope outside ourselves (in governance and technology) or fall prey to denial and despair. To actively heal and transform the suffering of climate change, we have to contemplate our place in the more-than-human commons and take responsibility for our collective wellbeing through practices of commoning.

Currently, many people's needs are met by systems which insulate them from the social and ecological harms most acutely felt in the Global South. Some people may choose never to sensitize themselves to the suffering these systems cause until they collapse. Nevertheless, relational ethics and contemplative practices provide methods for grounding the often complex, interlinking problems of injustice to a felt presence of these problems in our lives. They allow us to expand one's sense of self to become-with the world-in-becoming, while allowing us to cultivate a moment-to-moment familiarity with one's intimate relations to human and non-human others. Contemplative practices might help us not only become aware of our subjective (cognitive, affective, and sensorial) processes, but also become aware of the social and ecological conditions underlying our existence and the possibilities for transforming perception and behavior "intra-actively" with material transformations.[16]

[16] In her book *Meeting the Universe Halfway*, Karen Barad (2007) uses the term "intra-actions" to avoid the presumption of separable subjects and objects.

Chapter 4 Conclusion

Bauwens and Ramos (2018) argue that distributed experiments in commons-based systems already constitute the seed forms of a post-capitalist phase transition. Most commons remain small scale, so there is a lot to be done to make commons more widespread and consequential. Over the course of this dissertation, I have argued that a transition to a relational paradigm and a post-capitalist, commons-based economy is the best pathway to deliver combined improvements in sustainability, equity, and quality of life in the 21st century. In the conclusion, I will consider how the commons could be an expansionary, transformative force, taking realistic account of standard legal and economic systems and narratives, without either being too utopian or simply incrementalistic about it.

How exactly a societal transition to a common-based economy could be achieved is of course a matter of debate among post-capitalists. Visions of an alternative are constrained not just by the limits of our imagination but by current realities, possibilities, and opportunities for change. The commons-based practices and solutions exist to create the world we want, but it is difficult to identify the constraints and conditions supporting strategic and effective action. Transition discourses on post-development, eco-socialism, social anarchism, degrowth, and the commons suggest multiple pathways, each with different strengths and weaknesses (Escobar, 2017), while the field of transition design offers integrative methodologies for aligning visions with participatory design processes for enacting these alternatives (Irwin et al., 2015).

In *Envisioning Real Utopias,* Erik Olin Wright introduces a four-step analytic framework that explains how to build "concrete utopias" using: (1) a theory of social reproduction (to identify how current elements in the system are perpetuated), (2) a theory of contradictions (to

identify gaps and leverage points), (3) a theory of the dynamic trajectory (to identify where things are headed), and (4) and a theory of transformation (to strategically identify where we can positively influence current trajectories most effectively). In the fourth step, Wright outlines three different logics of transformation: (1) ruptural logics, which follow a classical socialist view of sharp breaks with the past, such as one experiences after a revolution; (2) interstitial logics, which follow a more anarchist logic whereby autonomous movements create transformation outside the influence (e.g. in the cracks) of the state or capital; and (3) symbiotic logics, which depend upon leveraging the cooperation of the state, as in social democracies, to achieve strategic goals. These three logics of transformation map quite closely to frameworks used by social movements (Moyerm, 1990) and the just transitions framework (Climate Justice Alliance, n.d.). A simpler shorthand to summarize them is: Reform, Resist, Rebuild. The following three sections (4.1-4.3) will explore how integrating these three logics could help to realize a Great Transition to commons-based postcapitalism.

4.1 Reformism through a Commons Transition Plan

Though commoning represents a third form of provisioning beyond the public or private sectors, cooperative market and state systems can nevertheless support the transition to a commons paradigm (Kostakis & Bauwens, 2014). A reformed state armed with a commons transitional plan that exploits new technology and modes of production could realize a societal transition to the commons (Lievens, 2015). In "Awakening to an Ecology of the Commons," Bauwens and Ramos (2020) provide a transition plan for building a global commons-based economy. Bollier and Helfrich have also thought about this challenge in the third part of their recent book, *Free, Fair and Alive* (2019), where they explored how to reimagine some of the

deep premises of property law to take account of the social aspects of commoning. They asked, for instance, how communities and resources could be socially embedded and how we might re-imagine the concept of property, so it isn't conceived only as private property to be controlled by money and markets. Although state and market systems often operate within a paradigm incommensurate with the commons, perhaps a *modus vivendi* could be reached so that commoning could be inscribed within law and state power. For example, a number of public-commons partnerships, especially at the municipal level, are demonstrating this possibility (Bollier & Helfrich, 2019).

Reforms focused on transitioning to the commons could include:

- Develop and legislate public-commons protocols
- Develop commons legal frameworks for non-humans, durable goods, capital and organizations
- Enact legislation to cancel and restructure debt
- Give reparations (land and money)
- Legally protect indigenous sovereignty and biocultural diversity

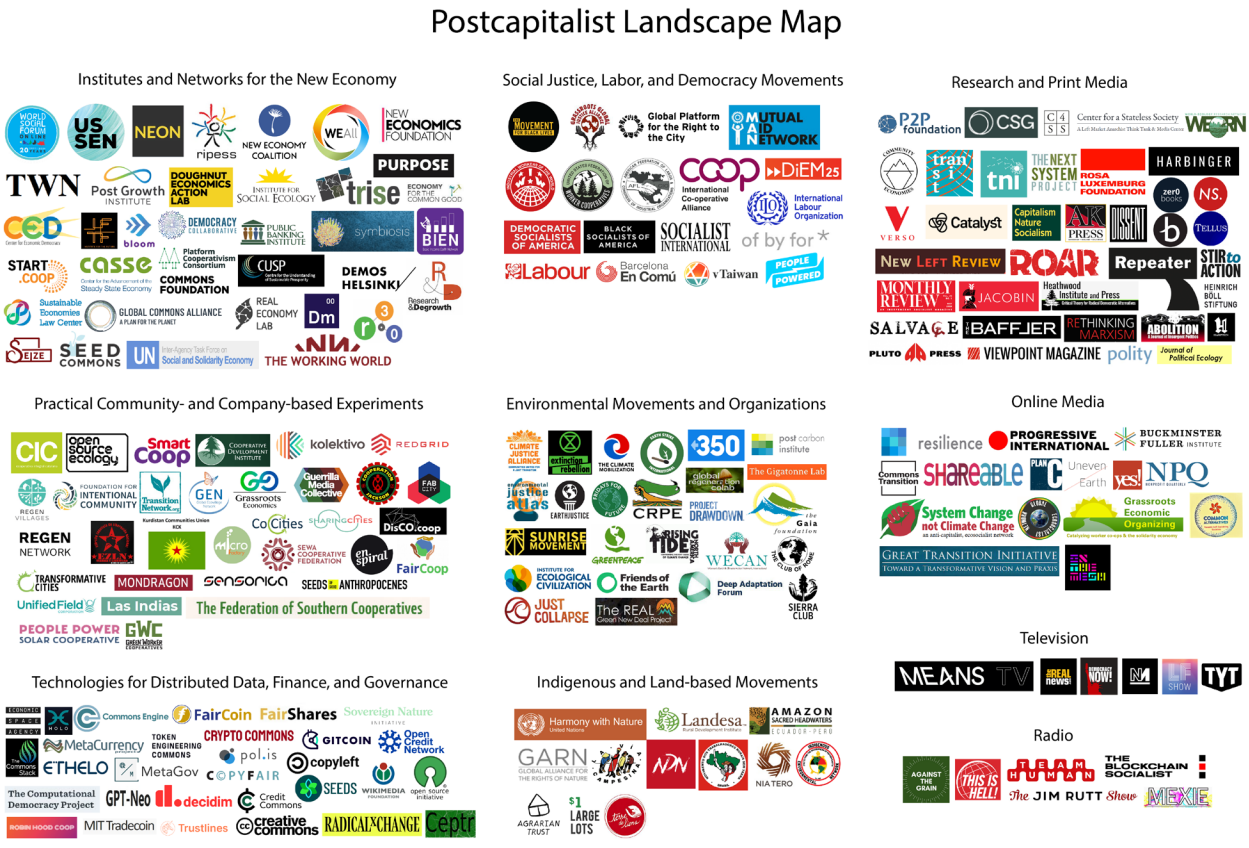
One of the perennial dangers of reformism, however, is that in negotiating with institutional power, alternatives are co-opted and absorbed into the existing system. As commons grow in scale and impact, they must learn to effectively deal with state and market power, which is deeply aligned with capitalism, without losing their integrity. As such, we must identify openings where a new political paradigm could emerge.

One of the major practical and political issues concerning the expansion of the commons is not that we lack different forms of commoning, or ideas about what kind of new institutions we can create, and how we could change existing institutions to be more in line with the commons. What is really lacking today is a sense of collective agency as a broader project of historical change akin to the scale of the socialist or communist movements.

Commoners don't have economic or material power, but they do have the power of their agency—the power of the people. As the commons increasingly develops and expands, whether in the economy, education, or agriculture, at some point it will face greater resistance from the state (and state legislation) and the market. So, what we need is a new form of collective agency committed to the project of the commons and capable of organizing enough collective power to fight existing powers. In the beginning, this will involve an extraordinary power struggle.

The challenge is that we do not know where new forms of collective agency will emerge, though there are existing social movements that provide some initial answers. Figure 2 provides a mapping of organizations and movements aligned with the transition to a postcapitalist commons-based society.

Figure 2



4.2 Shifting the Political Paradigm with Advanced Democracy

Shifting the political paradigm offers immense transformative potential. Many conventional forms of governance were created centuries ago based on a modern paradigm that is of limited relevance today. Much of the modern philosophic foundations for today's political economy were inspired by the philosophy of mechanism, as interpreted by Thomas Hobbes and John Locke and empowered by the idea of atomistic individualism, national sovereignty, and technocratic bureaucracy (Merchant, 1980, pp. 208-209). Similarly, modern production processes that dominate capitalist economics were born out of mechanistic philosophy and its resistance toward the organic (Giedion, 1969).

Contemporary political discourse continues to be trapped in modernity even though scientific thinking has surpassed the modernist paradigm since the beginning of the 20th century. Political thought still views agents as rational subjects, based on the legacy of Descartes placing rationality at the core of what it means to be human (i.e. *cogito ergo sum*). Political discourse also interprets relations primarily in terms of notions of simple causality between a cause and effect, as explained by the Newtonian worldview.

In this framework, the only way to create a more stable world and avoid abuse of power is to create a balance in which clashing forces neutralize each other. The whole of modern politics builds on notions of control. If agents don't achieve their political objectives, it's typically conceived that they lack the means (i.e. power, knowledge, etc…), or because someone was not compliant. And although people are increasingly using concepts of co-creation or cooperation, these ideas tend to have little traction in mainstream circles.

Attempts at political reform within the current paradigm are largely meaningless, because the paradigm itself is what drives today's social and ecological crises. Many of today's social and ecological problems reveal the critical limitations of the modern paradigm and call for emerging political forms that can better manage complexity, foster direct democracy, and sustain flourishing ecosystems.

To get at the root of contemporary political problems, it is therefore important to change the philosophical underpinnings of society to create transformation at the deepest level—at the level of the mindset or paradigm. If you don't change fundamental paradigms in relation to other social structures, eventually whatever you change in one social dimension will re-emerge according to your original premises and the pathological behaviors associated with them. Even if we transform structures through collaborative or network governance, if everybody in those structures still behaves in a hierarchical manner, power dynamics will not change, and certain people will continue to have more control than others. Blockchain, for example, is an innovative technology, but it has not yet radically transformed society, because it engenders capitalist logics of market exchange and speculation.

People tend to internalize old structures and lifeways so much they often reproduce habits and re-inscribe the old structures and patterns within new systems, severely limiting their transformative potential. For example, the Rights of Nature movement has generated radical new possibilities for governance, yet the whole human rights paradigm is still entrenched in the modern divide between nature and culture, and human and nonhuman. The translation of "nature" from a conservation perspective to an indigenous perspective, using concepts of the Earth as a living being— *Pachamama*— has met long-standing resistance from conventional western law,

nation-states, and the UN. Indigenous concerns are incorporated into the UN system under the UN framework of "intercultural dialogue." Within this framework, indigenous views of nonhuman persons and their rights are considered beliefs, and as beliefs, they are considered less valid sources of knowledge than, say, scientific studies. The social environmental impact studies that mining companies use to justify the development of mines therefore carry more legal weight than indigenous beliefs. By inscribing ontologies of non-Western and indigenous peoples within Western frameworks and languages, we also limit their transformative potential to modern liberal property systems and its political understandings of rights and representation (Viaene, 2021).

Bollier and Helfrich (2019) therefore claim that we need an ontological shift, or *OntoShift*, that can animate other structures of society, so that changes are deeply rooted in another paradigm, enough to sustain and avoid co-optation. Margaret Stout has developed a robust typology of governance in her 2016 and 2019 books with Jeannine Love to identify how specific ontological assumptions shape mutually exclusive social structures. They identify four "ideal types" of governance that we find most often—Hierarchical, Atomistic, Fragmented, and Holographic. Although everything in reality is a hybrid of these different types, ideal types are useful tool for identifying foundational patterns amidst a vast diversity of phenomena.

Each of the four types possess a pathological dimension if taken to an extreme. For example, if society is ordered primarily by supposedly natural hierarchies that place power in the hands of a select few individuals or organizations, then the pathology of bondage emerges. If society is structured primarily by the logic of atomistic individualism and liberty is conceived in terms of the supremacy of individual rights, then the pathology of isolation emerges. If society is

organized around fragmented, socially constructed identities and freedom is conceived as complete individual autonomy, then alienation arises. If society follows the logic of holographic sameness, such that collective welfare is viewed as more important than individual welfare, then the pathology of social absorption emerges. Soviet state communism is a good example of the latter, as an oppressive governance structure that fused individuals (parts) within larger forms of collectivism (wholes).

Margaret and Jeannine propose a fifth ideal type called Integrative Governance which is informed by process-relational ontology, and which uses dialectical synthesis to integrate the positive features of the other four types without taking on their pathologies. The idea of Integrative Governance was inspired by Mary Parker Follett, an American pragmatist who wrote *The New State* (1918) and who studied at Radcliffe, the women's college that integrated with Harvard University, around the same time Charles Sanders Peirce, William James, and Alfred N. Whitehead were professors.

Like process-relational ontology, integrative governance follows what is called a "differentiated relational ontology" (cf. chapter 1). Whereas undifferentiated relational ontologies completely fuse the parts within the whole, differentiated relational ontologies maintain a distinction between parts and wholes (Stout, 2012). Commoning reflects a differentiated relational ontology as different individual agents collectively manage resources and organize society according to both their distinct agency, preferences, and values and at the same time, a collective understanding of how they can work together in larger systems of coordination and integration.

Politics is not the byproduct of state sovereignty or market power over individuals. It is rather a democratic network of individuals, each of which have the capacity to determine for themselves what their role and responsibilities are. For example, Cecosesola is an association of 40 cooperatives in Venezuela. People do not have positions; they organize around tasks. There is a differential distribution of tasks based on the structure of a "heterarchy." One of the 28 patterns that Bollier and Helfrich (2019) coin to describe the commons is "rely on heterarchy" (pp. 143-145).

Heterarchy combines the structure of hierarchies and peer-to-peer networks. It differentiates domains of authority based on the different functions within an organization, (e.g., different people have different tasks and levels of responsibility), but these people do not have a higher authority to make decisions that affect the organization as a whole. Decision-making authority is thus functionally differentiated so that specific functions that require specific expertise are distributed among those people with that expertise (e.g. only professional doctors can perform surgery); but a decision that affects everybody, like the organization's pay scale, policies, or decision-making protocols for example, include everybody.

General tasks that do not require specialized skills are distributed among everyone in a rotation system that allows people to self-organize according to their needs and interests. People self-organize and self-select task groups and each person can be part of multiple task groups, though people devoted to hyper-specialized tasks like surgeons may be exempt. Within task groups, people openly discuss and arrive at collective decisions without always needing formal procedures for registering decisions, using such methods as voting or consensus-taking that are common within representative democracies.

In hierarchies, power is centralized and consolidated. There is a point of reference (e.g., an executive branch) where power originates and flows out from. In a heterarchy, by contrast, some people and tasks exert more influence over the system as a whole, but there is never a point of reference or centralizing executive function (as in a pyramid) where power is concentrated. The central distinction is that a hierarchy associates decision-making power with power *over* others, rather than how the scope of the decision affects more or less people, as in a heterarchy. For example, quality assurance is a function that requires a particular skill set and entails a substantial amount of risk. One person who possesses the needed skills assumes the responsibility and risk for determining if a product meets quality standards. Even though that person exercises more influence over the company (given how important their function is), they do not exercise any more authority or decision-making power relative to other employees.

Many collaborative economic and governance systems that emphasize participatory decision-making embody such features. A municipalist platform in Barcelona, called Barcelona en Comú, succeeded in forming a new collective political organization committed to the idea of the commons, based in part on earlier movements in Spain. Barcelona en Comú has introduced fluid structures of collective leadership, mechanisms for ensuring accountability by alternating positions of power, and local possibilities for citizen participation.

Democratic confederalism and sociocracy are also good examples of governance systems based on nested layers of democratic self-organization. Different domains of authority interact through processes of federation. A governing body consisting of representatives from all the functions of the organization could be created, and governing bodies could become federated, so that representatives from each comprise an overall governing body for an even larger umbrella

organization. An organization might create a representative of operations and a representative of culture, for example, then convene all the representatives within a given region to make decisions that affect everyone.

4.3 Building Protopolis: The Cyber-physical Commons

The world today has changed dramatically and, as I have argued, the best way to reorganize the system to sustain high quality of life under increasingly adverse circumstances is through a rapid decentralization of the political economy via economic and political democracy. On our current course, the world is headed toward a Great Unraveling precipitated by structural crises of global capitalism (e.g. debt crises, limits to growth, etc…), rising climate change and environmental degradation, rising social inequality, the stagnation of liberal democracy, and an insufficient capacity to manage complexity vs. the high cost of sustaining complexity (Tainter, 1990). Left without a viable alternative, these factors will lead the world to 3-4 °C of global warming, increasing instability and systemic shocks, and the synchronous failure of multiple systems (Homer-Dixon et al., 2015), leading to societal breakdown and some dystopian mix of authoritarian capitalism, technocracy, eco-fascism, neo-feudalism (Kotkin, 2020), and/or anarchy.

Given that there will be proliferating and intensifying crises over the next few decades, we have to focus most of our energy on making a viable alternative system that can improve well-being as market and state systems collapse. Efforts to reform and resist (cf. 4.1 and 4.2) should be in service to the core pillar of building a viable alternative to capitalism, otherwise they amount to rearranging the deck chairs on a sinking ship—they will likely reduce suffering in the interim, but they will not support adaptation and resilience amidst catastrophic collapse.

From a systems science perspective, there are several requirements that an alternative system must fulfill to adequately address the reality of the Great Unraveling:

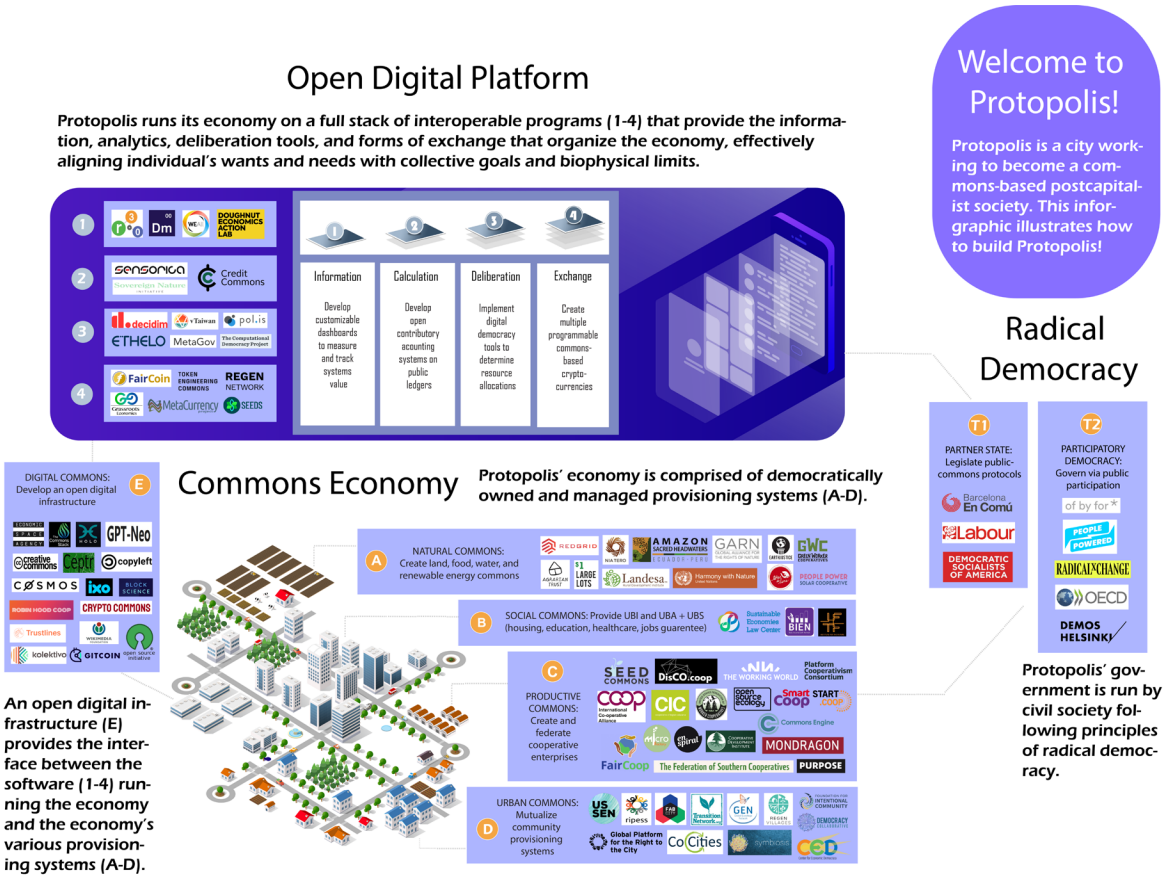
- More equitable allocation of and access to resources
- Greater "free energy" efficiency and lower consumption
- More effective use of information
- Distributed sensemaking and decision-making systems
- Greater coordination across organizations at various levels of complexity
- Greater creativity, adaptability, and resilience

In this concluding section, I will describe a strategy for building a viable alternative to capitalism that meets these requirements. The alternative I sketch takes place in a speculative city called Protopolis. Protopolis is a city in Protopia, a term coined by American futurist Kevin Kelley. Unlike a dystopia—a world that goes horribly wrong—or a utopia—a world that is so idealistic, it literally means "no-place"— protopia is a realistic image of a society that gets better, in the ways that matter most, year over year.

Protopolis organizes its economy around cyber-physical commons because the integration of digital tools with commons-based systems uniquely addresses these needs in a way that is scalable. Economic, political, and technological democracy is at the core of Protopia. This is particularly important as society increasingly faces "wicked challenges" (e.g. climate change, social inequality, etc…) that demand dramatic improvements in distributed sense-making and choice-making to enhance collective intelligence and to distribute resources more equitably, effectively, and efficiently. Effective polycentric and multi-level governance is required to rapidly implement and manage sustainability transitions in a matter of decades. Economies should strive toward greater self-organization by practicing decentralized planning within a community norms framework.

Figure 3 provides an integrated model outlining Protopolis' commons-based government (parts T1-2), economy (parts A-E) and the digital systems that run it (parts 1-4).

Figure 3



Parts T1 and T2 shows that governance in Protopolis follows principles of radical democracy. Citizens regularly participate in decision-making processes through practices of advanced democracy (e.g. sortition, citizen assemblies, quadratic voting, liquid democracy, etc…). Protopolis enlists state power only as a transitional requirement to achieving a more fully democratic society run by people, not politicians. The partner state serves to enact reforms encouraging that transition (see sections 4.1-4.2 for a description of reformism and governance).

Parts A-D comprise the physical provisioning systems (e.g. natural, social, productive, and urban commons) that constitute the base layer of the economy. The following four strategic activities construct the foundations of Protopolis:

- Create land, food, water, and renewable energy commons
- Create social commons (housing, education, healthcare, UBI, UBA, UBS)
- Create and federate cooperative enterprises
- Mutualize community provisioning systems

Protopolis is able to democratically plan and organize its economy using an open digital infrastructure (part E) and a stack of interoperable programs (parts 1-4). These programs help collect and analyze information, calculate value, and facilitate deliberation and the exchange of goods and services.

Taken together, these systems collectively distribute power to people, allowing resources to be under democratic control and management. When you create systems that distribute power and organize people around shared goals, communities will not just survive the coming crises, they will thrive. Although Protopolis is a speculative city, all of its components either already exist or could exist with modest investments in their development. The icons within Figure 3 identify some of the leading organizations that are actively developing each component.

A frequent challenge of both commons and radical democracy in the past concerns issues of scaling. To what degree can they exist not just within smaller communities and organizations, but within and across regional communities, national governments, and global systems? And how would larger communities and systems empower individuals and smaller communities, rather than exercising power over them?

The traditional benefits of centralized hierarchies are that individuals who cannot account for the whole can delegate higher authority to governing bodies with higher capacities for sensemaking and decision-making. Although participatory democracy has been successful at smaller scales, it has often failed to coordinate decision-making at such larger scales. It is exceedingly difficult for individuals to have a complete understanding of complex decision-making processes at global scales. Today, decision-making processes require a very high degree of sense-making to produce the collective intelligence required to address complex social and ecological challenges. Centralized hierarchies have thus been legitimized, in spite of producing rampant abuses of power, because they delegate authority to select groups and individuals deemed to have (rightly or wrongly) greater capacities for sense-making and decision-making.

Imagine, however, if resources that are readily available and nearly infinite, like information, were accessible to everyone. Right now, the market values (and rewards!) artificial scarcity. Things that should be abundant like information (e.g. art, software, research and design, etc...) are made artificially scarce through modern intellectual property systems. But in a commons-based society, we could compensate the creators for the initial effort of producing something like a research paper or design schematic, and then make that work publicly available, vastly increasing our human potential for innovation with more efficiency and less ecological harm.

Leaders in Silicon Valley often tell us that their technologies can change the world, but locked in 18th century economic thinking, they've left unrealized potential of the information age on the table. The same tools that have created historic inequality today can also be used to create genuine abundance, if sharing information and innovation become the basis upon which

we organized a new society, rather than squeezing it for its maximum dollar value. Developing open knowledge commons and digital commons is one of the keys to political and economic democracy (see part E in Figure 3).

We all have unique skills, talents, and strengths that we've picked up throughout the years, whether it's playing a musical instrument, building a successful business, or just having an interest in cooking. Facebook probably knows a lot of your interests, hobbies, and skills. Now imagine a similar, but open-source platform for mutualizing provisioning (see part D in Figure 3). Now instead of being scraped to target ads at you, we could create easy ways for people to swap a piano lesson for a pie, childcare for coding, or therapy for teaching, to exchange the skills they have for ones they need and, in the process, create new economies of care and learning. This is urban commons in a nutshell—it provides people a way to self-govern their community's resources and create the terms of exchange.

We can also give communities the tools to self-govern and distribute resources based on their goals. Right now, the market says something is valuable based on how much money another person is willing to pay for it. But what if we valued other things? Things that really matter, like social good or the health of the planet — and then what if we reflected that in the price of things and the design of systems that bring them to us? For the economy to be goal-oriented, instead of profit-oriented, it needs to accommodate multiple forms of non-financial value, including natural, human, social, intellectual, and constructed capital. We could develop customizable dashboards with systems value metrics that help us allocate goods and services to meet our goals within thresholds (Baue & Thurm, 2020)(see part 1 in Figure 3).

To ensure that we meet our three non-negotiable requirements of a Great Transition—drawdown, degrowth, and basic abundance (cf. chapter 3.2)—we must also adopt and enforce measurements that incorporate limits. Given the intrinsic relation between all three dimensions, trade-offs between them is highly undesirable, so we need to develop a composite metric that integrates all three dimensions. Determining whether or not something is genuinely sustainable depends upon a normative assessment of "what is" in comparison to "what should be." The Sustainability Quotient, introduced by Mark McElroy (2008), defines sustainability as the difference between something's actual vs. normative impacts on the carrying capacities of vital capital resources.

One of the central reasons for the failure of mainstream definitions of sustainability (e.g. triple bottom line, ecosystem services, SDG's) is that they focus on the numeration of actual impacts without setting prescribed limits. Thresholds and allocations are used by environmental economics to measure the environmental constraints for social and economic development and ensure that development does not surpass safe ecological limits and compromise the living systems upon which it depends.[17]

Currently, the best overall measurement for assessing upper and lower limits is arguably the social and planetary boundaries framework (Raworth, 2017). It has the strength of integrating the requirements for achieving a just society and a safe environment in one consolidated framework that measures progress in each relative to each other. The framework helps delineate the targets and thresholds of how progress along important variables (e.g. climate change, biodiversity, land use) produces more or less equitable and ecological outcomes (Rockström,

[17] For a history, see (Center for Sustainable Organizations, 2021).

2021). Another important strength of the framework is that it is operational, having been applied and adapted to communities at various scales.[18] It is also supported by a growing evidence base and a growing number of institutions and communities that use the framework.

Modern digital technologies have changed our society in so many ways, and we now have the tools to actually make our economy operate based on a staggeringly simple operating principle: to meet our shared human goals. If Amazon can deliver virtually anything to your house in a few days at the tap of a screen, we can surely harness these technologies to do much bigger, more critically important things. In *The People's Republic of Walmart*, Leigh Phillips and Michal Rozworski (2019) show that multinational companies like Amazon and Walmart already demonstrate we have the technical capacity to organize and plan global economies—the only question is will we leave it to corporations to centrally plan them, or will we repurpose the same technologies to democratically plan the economy to meet shared goals.

Today, economic calculations are typically performed by a price system following principles of market exchange (i.e. supply and demand). Prices don't reflect the true value and costs of goods (i.e. their use value, labor value, social and environmental footprint, etc...), but they remain the default method of calculation, because the centralized planning of production, consumption, and distribution can create even worse systemic problems (i.e. regulatory capture, corruption, inequality, inefficiencies, etc...). Centralized planning has often created gross inefficiencies and economic failures. 20th century information processing and coordination systems were not sophisticated or agile enough to produce accurate and appropriate signals, and information and power asymmetries incentivized corruption. More recently, however, digital

[18] See for example, the adaptation of the framework: Doughnut Economics Action Lab, 2020.

technologies are increasingly able to manage information and resources efficiently and equitably through either market or non-market planning, providing future potentials for democratically calculating and distributing value.[19]

"Holopticism" describes the capacity of every individual to see the whole, to make sense of their inter-relationships to others and the whole, and to make sense of what they need to do as both a unique individual and member of the wider community. Holopticism does not fuse the part and whole, as in Holographic Governance; it treats them as distinct, separable entities that can be effectively integrated. Collective intelligence is optimized when there is holopticism, but typically, individuals do not have access to and/or cannot make sense of all the relevant data to account for entire systems, especially when they take day-to-day responsibility for concrete tasks that limit their focus field.

For the first time in history, however, we can potentially have distributed decision-making at any scale. Thanks to emerging digital technologies, information flows can be distributed across the system in ways that are rendered meaningful for specific agents. By combining communication and sensor technologies with the nonproprietary exchange of data (i.e. everybody owns their data and freely shares it), we can create feedback loops for the free and efficient exchange of information. Digital information technologies that help us process, share, and make meaning of complex and diverse information flows will help us exceed the prior limits of our individual (cognitive) and collective (organizational) capacities for sense-making and decision-making. Developing open contributory accounting systems on public ledgers that enable smart contracts can provide a transparent platform for accounting value across multiple

[19] For more information on democratic economic planning, see: Hahnel, 2021.

value streams and allow different agents to exchange value through smart contracts (see part 2 in Figure 3).

In order to make these services come to life though, people need a way to make choices together about what's important to all of us. As we've seen in every election cycle, this isn't always easy. That said, there are new platforms emerging that pave the way for a new, upgraded form of democracy. Our current systems of electing representatives were built on 18th century technology. We can do better. Imagine using the swipe of your finger to participate in more frequent, remote, and better-informed democratic decision-making. It might sound radical, but we already have examples of this happening in the real world.

We now increasingly have the capacity to render information flows meaningful for specific agents and organizations. People can self-select data based on who they are and what they need in real-time. People can receive enough relevant information to make informed decisions about complex issues, and decision-making processes can be efficiently distributed across networks to integrate everyone's input. The flow of information enables individuals to see the whole from each point of decision-making and make responsible decisions towards the whole. With digital democracy tools at our disposal (see part 3 in Figure 3), we can integrate decision-making processes across different decision domains at any scale. Decision-making can become fully democratic and decentralized at much larger scales than heretofore possible.

Taiwan has most recently piloted some of these eDemocracy tools in successful ways and enabled citizens to have more autonomy and agency in the political process.[20] And they're not

[20] https://info.vtaiwan.tw/

the only ones. Several municipal movements around the world developed digital tools to visualize this kind of integration. Barcelona en Comú uses online tools to extend democratic participation to all citizens, so they can harvest the collective intelligence of the city as a whole. They are using an online platform to allow citizens to make budgetary proposals, integrate and coordinate information about proposals, and decide on them through direct democratic decision-making processes.

One of the best examples illustrating how technology can facilitate the expansion of the commons is a new set of digital protocols for networked collaboration called Holochain.[21] Holochain is a Distributed Ledger Technology (DLT) intended to enhance human agency following commons-based design principles. The technology allows groups of people the freedom to design their own systems of governance using digital tools that can assure the "digital integrity" of the community by, for example, preventing anyone from tampering with the data and helping identify when someone is defying the rules. The technology is agent-centric— it allows individuals within the community to determine rules of governance and how they wish to respond to infractions.

Communities can decide what happens with surpluses, for example, so that rather than giving surpluses back to a company that owns the rights to critical resources, as conventional market economies do, communities could instead treat the resources as tradeable currencies and reinvest surpluses according to community needs and priorities. Rather than a person returning the excess solar energy from their houses to a company that owns the electrical grid, for example, they could share it with neighboring schools or organizations in need.

[21] https://holochain.org/

The MetaCurrency project[22] is an affiliate of Holochain building the technological tools and social patterns needed to enable an emerging ecosystem of distributed, equitable, and regenerative economies. They are currently training communities of developers to design mutual credit crypto currencies which can be programed to engender specific values and dynamics. These could be programmed to ensure that exchange meets community goals within social and ecological boundaries (see part 4 in Figure 3). We could, for instance, develop and implement a carbon currency based on the idea of tradeable energy quotas (TEQs), offering a fair and effective route to carbon zero by 2030-50 (Alexander & Floyd, 2020).

Technologies like Holochain have the potential to fundamentally transform production and distribution of food, energy, water, and other sectors into commons. What's beautiful about these technologies is that they are applicable to almost any domain, allowing us to design commons-based systems in diverse sectors such as education, agriculture, and energy. The Commons Engine is an affiliated organization investigating ways to apply these technologies to social innovation in managing energy, water, land, and other resources.[23]

Community power can use new technologies to effectively and equitably distribute resources based on a combination of people's needs and preferences, community goals, and ecological limits. What if, for example, durable goods — things like buildings, machinery, tools, equipment, and vehicles — were shared with groups or communities, improving access for all with lower financial, social, and environmental costs? We could also coordinate the equitable distribution of these goods in a convenient and effective way with open data collection, analysis,

[22] http://metacurrency.org/about/
[23] https://commonsengine.org/

and decision-making systems designed to meet everyone's needs and goals. In this way, we can manage information, communication, and exchange, and yes — meet everyone's basic needs — even as our world comes under more stress.

Granted, not all of these activities can be executed all at once—Protopolis has to transition from today's capitalist society to a commons-based society. Given the different levels of investment required to develop each component and the different time horizons required to meet our non-negotiable goals—drawdown, degrowth, and basic abundance—it is important to have a transition plan that stages development over the next few decades. Even though many activities will be running in parallel, some need to be given more time and attention at different stages.

In the immediate short-term (0-10 years), the prime directive should be to implement a renewable energy infrastructure, so that we achieve zero carbon emissions by 2030. Net zero policies rely on unproven carbon capture and sequestration technologies, carbon offsets, the unsustainable extraction of raw materials, and the colonial occupation of indigenous lands. These must be replaced by a commitment to Real Zero (Friends of the Earth International, 2021). Fortunately, the rapid development of green technology and storage capacity make it not only technically feasible, but the price of renewables has dropped so far, they are now economically competitive with fossil fuels. We are on the cusp of "the fastest, deepest, most profound disruption" of the energy sector in over 100 years (Dorr & Seba, 2020). If political reforms provide sufficient institutional incentives for the transition, then we could see a rapid transition, allowing us to stay on a path toward limiting global warming to 2°C above pre-industrial levels which is needed to stabilize the Earth system. Besides investing in renewable energy,

governments need also simultaneously divest from fossil fuels, issue moratoriums on new carbon-intensive development and fossil fuel infrastructure, retrofit existing infrastructure, implement circular economic models, and cap and ration carbon (ideally through a fair market mechanism like the carbon currency proposed above). To enforce global thresholds, governments could also implement a global thresholds and allocations council (r3.0, 2019).

In the medium term (0-20 years), the prime directive should be to mutualize value and mutualize the production of goods and services, so that we can lower our ecological footprint while equitably fulfilling everyone's needs. This will require continuing to develop and connect commons within an institutional infrastructure that supports their development at a global scale. In particular, we should develop specific city-wide transition plans for mutualizing exchange and production across sectors (i.e. food, energy, mobility). This will ensure that we meet our sustainability and equity goals in a concrete and measurable way while transforming cities at the intersection of local and global change. The Commons Transition Plan for Ghent provides an excellent example of how to do this (Bauwens & Onzia, 2017).

In the long term (0-30 years), the prime directive should be for a post-capitalist commons-base phase transition to embed the market and state within a commons-based protopian civilization. Social, technical, legal, and policy innovations should be combined to create a radically democratic economics in which cooperative, democratic forms of ownership, governance, finance, and exchange become the norm. By 2050, the global economy should be a steady-state economy in which cultures of commoning (cf. chapter 3.4-3.5) predominate, creating high-quality lifestyles focused on sufficiency and conviviality, not growth and consumerism.

Of course, the potentials we are discussing require many other shifts to be realized as well. They require further evolutionary developments of *Homo Technicus*— the symbiotic integration of humans and technology—which could always serve to accelerate exploitation and capitalism, rather than the commons, if they are subject to corporate and state capture. As such, it is essential to support the further development of collective awareness and the progressive embodiment of the relational paradigm (cf. chapter 1 and 2). Not only do we need to create new possibilities within existing institutions, we need to train people and institutions how to embody and enact new ways of being.

The commons has already provided the means for communities affected by today's multiple crises to generate shared resources and reclaim self-determination. The most inspiring aspect of the commons is how it embeds tried and tested means for community flourishing within the relational paradigm. As such, it offers a globally dispersed movement of local initiatives implicated in a true paradigm shift (cf. chapter 3). The commons stands at an intriguing and compelling point of convergence between a passing world built in the image of modernity and a new world. By invoking the commons, we place ourselves at a powerful convergence of conversations and struggles for new forms of radical co-existence. We are invited to consider, for example, the generative inter-linkages between the commons, indigenous life worlds, and undercurrents of process-relational thinking that radically subvert the modern paradigm. To expand the commons, we need to cultivate possibilities within existing institutions that allow for another logic and way of relating (reform); we need to change the paradigm of politics (resist); and most of all, we need to build a viable alternative, such as suggested by the example of Protopolis (rebuild).

Appendix: Course Lecture Transcripts

A.1 Transcript: The Crisis of Connection

[title page]

Global eco-crisis is a crisis of unhealthy connections between personal, social, and eco-systems. Eco-systems are breaking down. We all witness climate change, biodiversity loss, extreme weather events, and toxic environments. This breakdown is caused by extractive and exploitative social practices, like over-consumption in the Global North, the debt- and growth-based economy, the colonization of lands, peoples, and cultures, and fossil fuel dependency within our global energy system.

[slide 2]

Underlying both of these, there is a crisis of perception linking eco-crisis to an inner, spiritual struggle over what it means to be human. Enlightenment thinkers like Isaac Newton, Immanuel Kant, Rene Descartes, John Locke, Thomas Hobbes, and Francis Bacon developed some of the core tenets of the modern worldview—a worldview based on separation and dualism.

[slide 3]

These thinkers extolled the virtues of rationalism, secularism, and humanism. They developed a way of looking at the world like a clock. Whole systems were reduced to their constituent parts and analyzed in terms of mechanical interactions. Nature was understood to be an object—a resource—for people to exploit. The capacity to shape the world through

technology underpinned notions of progress, creating a culture of individualism and industriousness. The result was a civilization organized on the basis of separation among people, between people, and between peoples and nature.

[slide 4]

People lost touch with their intrinsic sense of relatedness. Social systems of hierarchy and oppression institutionalized patterns of dominance between in-groups and out-groups. Patriarchy, racism, colonialism, and scientism became ever-more empowered. The masculine principle dominated over the feminine principle, white Euro-Americans dominated over people of color, and reason suppressed intuition. The practice of othering lesser-valued humans and nonhumans created massive, widespread social and ecological injustice.

This is an old story. Now, we need a story that moves us back into right relationship with ourselves, with other humans and with nonhumans. The story of separation was the story of Western modernity. It continues to have immense power; but, fundamentally, it is based on flawed assumptions about humans and nature.

Take a moment to think about nature? What do you see? What do you feel? What do you hear?

[pause for 5 seconds]

Perhaps you see a green pasture, a snowcapped mountain, or a gushing waterfall. Perhaps you feel the wind, smell the grass, or hear the birds. Often nature is represented in wilderness. But this idea represents nature as an object—as something people can consume if they have

enough privilege to leave their busy lives and travel to the great outdoors. This is a romantic ideal inherited from the modern era.

In truth, nature is not something that exists outside us. We are all part of nature. We've all shaped nature. Nature is us, and we are nature. Cityscapes, power plants, and highways are part of nature—regardless of whether they are organic or good per se. It is time people's worldviews shifted from a worldview based on separation and dualism to one based on responsible and healthy interconnection.

The modern worldview is not just highly destructive. It is also woefully outdated, based on centuries' old science and philosophy. The most adequate, up-to-date view of nature is the systems view.

[slide 5]

In the systems view, everything is a system—a microbe, a forest, the internet, the economy, religious traditions, and the cosmos itself. Society and nature comprise systems of systems, relationships of relationships. In the systems view, everything is intrinsically connected and has intrinsic value. Humans are not at the center or apex of moral concern. All living beings possess a desire and right to life. Life is the center of moral concern. The good life is about cultivating healthy, flourishing relationships as members of the Earth community.

In the film, Mindwalk, three characters—a scientist, a poet, and a politician—discuss the shift from the modern worldview to the systems view. Each character represents aspects of the systems view which are incomplete unless fully integrated. The scientist understands interconnection conceptually but struggles to be in loving relationship with her daughter. The

poet perceives the unspeakable beauty of life's complexity, but remains isolated, afraid to accept life's messiness. The politician lives a life of service but struggles to lead people out of moral conviction. What the film teaches is that the systems view can only be fully realized when what we know, embody, and enact are integrated in relations that support all life's flourishing.

[slide 6]

Cultivating this kind of integration across systems is essential to overcome systems-level crises. Attending to personal, social, and eco-systems in isolation is inadequate, since the flourishing of systems depends on the cultivation of healthy relationships between them. Strengthening social connection fundamentally leads to flourishing between systems. This is called sympoiesis—or co-creation. All life is self-organizing in relation to others and to the environment. Things embody relationships to themselves, to others, to what came before, to what is, and to what may become.

[slide 7]

This story of interconnection locates individual systems and stories on a continuum of experience. The continuum dissolves strict dualisms between the inner and the outer, subjects and objects. When somebody's experience becomes a frame of reference—when they have the power and privilege to tell a story— they become a subject. Nature is, as Thomas Berry said, a communion of subjects, not objects. Everything is a subject in its own right.

By relaxing the sense of separateness that we hold, we can experience more and more what is outside us, in relationship to us, constituting us, until gradually, our sense of self falls away and just the experience of being in relationship comes to characterize our experience.

[slide 8]

By experiencing our relations to ourselves and to others in the Earth community, we develop greater and greater ecological awareness. From this awareness, we can act out of love by receiving and extending care to others, human and nonhuman. Receiving and extending care to members of the Earth community is at the heart of a love-based approach to sustainability. By sensing that our bodies are part of the Earth system, we may listen mindfully to the sounds of the Earth crying, as Thich Nhat Hanh says. We may respond with love to the suffering of others, knowing that we are implicated in their suffering. None of us are well, until we all are well.

This is the story of interconnection. The eco-crisis derives in part from a crisis of perception, challenging people to reconsider what it means to be human. To respond effectively with love and care, we need to call each other back into healthy relationship with all life. Thank you.

A.2 Transcript: Getting to the Root of Eco-Crisis

[title page]

Eco-crisis is the byproduct of so many converging crisis—personal, social, and ecological. The health of the planet mirrors the health of our bodies, communities, and habitats. Bodies are porous. Toxic air, water, and land contaminates us. All of us carry microplastics and heavy metals within us. Junk food impairs our mood and brain functioning. Gross inequality tears at our social fabric, creating zones of exclusion, competition for basic needs, racism and hostility. Scarcity of resources, extinction events, and extreme weather events reduce the health and safety of our communities and environments. To get at the root of eco-crisis, we need to

develop our capacity to see the complexity and intersectionality of multiple converging crises. Nothing happens in isolation.

The image on this slide shows a thousand-hand Guanyin Bodhisattva, or Qianshou Guanyin Pusa in Chinese. It is a symbol of infinite compassion born of penetrating insight. Each of the thousand hands has an eye, extending its perspective in a thousand directions. What is most remarkable about the image is that it's an emblem of seeing with more than one's eyes. The hands belong to members of a disabled Chinese dance troupe, which you can find more information about in the Dig Deeper resources for this lesson. The dancers are deaf, so they can't hear music, yet they dance in perfect synchronization, because they have an acute ability to see, to sense, each other in relationship. This ability to sense systemic relationships in context is essential to understand the complexity of the eco-crisis.

[slide 2]

In the systems view, the breakdown of ecological systems is effectuated by the breakdown of interlocking personal and social sub-systems. Intervening within a given system always has unintended consequences—ripple effects that cannot be predicted, because systems are composed of other systems, other relations, that we struggle to perceive, let alone understand. Each system is composed of dynamically interacting subsystems. Relations between systems give rise to structures that regulate behavior both within and between systems. To properly understand eco-crisis, one must account for all these relations and their dynamics.

[slide 3]

One must view sustainability as itself a complex phenomenon, involving many different personal, social, and ecological systems. The industrial lifecycle of a smart phone, for example, is incredibly complex, involving systems of extraction, manufacturing, design, distribution, consumption, recycling and disposal.

Take a moment to sense the systemic relationships between smart phones and other systems in the context of sustainability. Consider the relations between smart phones and inhumane working conditions...[pause]… deforestation…[pause]… chemical pollution…[pause]… transportation…[pause]… power generation…[pause]… and electronic waste? What comes up for you when you consider these relations? How do you feel?... [pause]…

Often, people see eco-crisis as something remote. This exercise suggests we can see our intimate relations to eco-crisis by considering the mundane ways we communicate, the values we have, and the daily choices we make within systemic contexts.

[slide 4]

This capacity can be further developed by beginning to see eco-crisis as a global manifestation of many interrelated crises. Bigotry and discrimination, gender inequality, peak oil, extractivism, consumerism, elitism, the refugee crisis, xenophobia, drug and alcohol abuse, mental illness—these personal, social, and ecological crises contribute to one another and exacerbate eco-crisis. Higher order global crises emerge out of the compounded effects of lower order, localized crises.

[slide 5]

This image taken from the World Economic Forum's 2018 Global Risk Report illustrates how more localized crises are connected to larger global crises. Oil price shocks, water crises, and the failure of critical infrastructure, for example, create social instability. This could lead, for instance, to a popular uprising, precipitating a government's collapse—that could in turn lead to run-away inflation, mass unemployment, and large-scale migration. All of these phenomena are typically presented in the news as separate, isolated events. Even if the news links a few of these events, very rarely do they ever discuss the social and ecological conditions that gave rise to them. They rarely explain that the oil price shock, the water crisis, and the failure of critical infrastructure, for example, were in part caused by energy shortages, climate-induced drought, and super storms.

[slide 6]

Yet none of these phenomena can be picked apart and dealt with in isolation. Understanding the intersectionality of socio-ecological crises is crucial. Not just because it's needed to correctly diagnose the complexity of today's problems, but also because it's needed to offer synergistic solutions that address the interlocking nature of today's crises. This image depicts a holistic approach to the UN's sustainable development goals, illustrating how different goals feed into and strengthen one another. Improving food security, for example, helps eliminate poverty, enhance health and wellbeing, and reduce inequality. Seeing the relations between goals helps develop a coordinated strategy for achieving greater progress.

[slide 7]

Since there's an overwhelming number of systems and sub-systems that compose today's global sustainability challenges, it's helpful to identify which are the most pervasive and entrenched systems that contribute to them. The six systems listed here can be considered some of the underlying systems driving eco-crisis. Capitalism, anthropocentrism, patriarchy, militarism, colonialism, and white supremacy create profoundly unsustainable relationships between people and nature based on systems of hierarchy and domination.

[slide 8]

Capitalism creates a class of people whose wealth is extracted from the energy, resources, and labor of others, both human and nonhuman.

[slide 9]

Anthropocentrism creates a hierarchy of beings with humans at the top. It describes how people form standards for reasoning, judging, and acting in the world based on their needs, concerns, and perspectives to the exclusion of nonhumans. As a result, humans dominate over nonhumans, despite being just one species in an incredibly diverse web of life.

[slide 10]

Patriarchy creates patterns of male domination over women that is reflected in domination over nature—both of which are seen as objects for exploitation and commodification.

[slide 11]

Militarism creates some of the worst cases of abuse, violence, genocide, and ecocide. The military is the largest consumer of oil. Military expansion and build-up drives imperialism, conflict, terrorism, and global insecurity. There is arguably no greater waste of resources than destroying and rebuilding countries for profit.

[slide 12]

Colonialism creates unequal power relations between countries and peoples at the core vs. periphery of the world system. Those who have access to power dominate those who do not by seizing their land, resources, and labor, and by integrating them in a global system of unequal exchange intended to keep them in a subservient position.

[slide 13]

White supremacy systematically excludes people of color from access to power, wealth, and privilege. Today, the effects of eco-crisis are most acutely experienced by people of color. Air pollution, toxic waste, water and soil contamination all disproportionately affect non-white populations.

Generally, those who are not served by current systems are most attuned to eco-crisis, because they experience social and ecological breakdown and are not blind to today's systemic failures. Seeing the root of eco-crisis thus requires understanding the oppression of working-class people, women, people of color, indigenous people, and small island nations, for example, as interlocking forms of social oppressions underlying eco-crisis. To get at the root of eco-crisis, we must develop the capacity to see with more than just our eyes. Thank you.

A.3 Transcript: Personal and Planetary Hospice

[title page]

After seeing what's at the root of eco-crisis, we need to heal ourselves, each other, and the systems we participate in. We can't envision futures of flourishing if they're not grounded in healing. The common mistake people make after identifying a problem is to jump to solutions. Without healing, the solutions we implement will reproduce many of the same problems.

[slide 2]

The 7 stages of grief listed here illustrate a stepwise process for coming to terms with eco-crisis. It's natural to move through all of these stages at different periods of time. There's not always a linear progression between stages. We may find that we oscillate between multiple stages or revert back to prior stages. When it comes to facing eco-crisis, most people and cultures are stuck in the first five: shock, denial, anger, bargaining, and depression.

Our initial reaction is often shock, because the complexity and depth of the crisis is so overwhelming. After shock, people often move to denial. This takes many forms, such as challenging scientific evidence, looking for disconfirming evidence, minimizing severity and risk, or otherwise deflecting, diverting, or distracting attention away from eco-crisis. Another common reaction is anger. Anger can be an important catalyst if righteous indignation at injustice motivates transformative action. People get stuck in anger, however, when they confuse or externalize problems, mistaking who or what is responsible, and forsaking their own agency. At other times, when we bargain, we try to manage anxiety or anger by looking for quick fixes. Sometimes, for example, we overemphasize technical or lifestyle solutions, because by focusing

on low hanging fruit, we neglect the need for more challenging cultural and systemic changes. When anxiety and anger turn inward, we may get stuck in depression. Depression can also be helpful, however, if we're sitting with the reality of eco-crisis and probing its depths. If we give ourselves time to investigate our depression, the realization of eco-crisis may sink in. Moving through, we can then engage in deeper transformation, because we understand the severity and depth of the crisis, and commit to acts that address its underlying causes, not symptoms.

The goal of moving through this process is not to get stuck in the first five stages, but to eventually arrive at acceptance, so we can focus our energy on testing realistic solutions. By fully accepting eco-crisis, we shift our energy to working with it, not against it.

[slide 3]

Take a moment to acknowledge our current trajectory: Decades of political inaction, incremental reform, and sustained economic growth have put us on a path to 3-4 degrees of warming by 2100, which experts say is incompatible with an organized global civilization.

[slide 4]

Since market forces and policy reforms have been ineffectual, the collapse of conventional worlds has now become inevitable. Modern industrial civilization will soon end. The world that replaces it could be both more beautiful and more chaotic. We are left with two futures: Barbarization and Great Transitions.

Barbarization describes a world beset by social and ecological breakdown where deeply unequal societies compete for resources. The Great Transition describes a future in which society

is comprehensively reorganized to sustain itself in dynamic equilibrium with the Earth's systems. The difference between the two is in no small part related to healing. If we do not practice healing, we will reproduce the problems that created the crisis, leading us further down a path toward Barbarization. If, on the other hand, we use the crisis as an opportunity to heal old wounds and innovate new ways of living based on collective flourishing, we turn toward the Great Transition.

[slide 5]

As Brooke and I said in our Open Democracy article, both these visions hold a certain truth because both are already happening. In our view, the heart of spiritual practice is to stay attuned to both truths—to help people adapt to near-term social collapse, while cultivating the positive potentials of the Great Transition.

[slide 6]

The Deep Adaptation forum, initiated by Jem Bendell, is an emerging platform for people who accept the inevitability of climate-induced social collapse and who wish to focus on building community and developing positive responses to collapse. Books like this one by Carolyn Baker provide helpful guidance and rituals for spiritually navigating the challenges of eco-crisis. You can find more information in the Digging Deeper resource list for this lesson.

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Joanna Macy's body of work provides even more extensive resources for group-based therapeutic practice. Her work combines insights from systems thinking, deep ecology, and

engaged Buddhism. She says there are three dimensions of the Great Transition: 1. actions to slow the damage to Earth and its beings; 2. analysis of structural causes and the creation of structural alternatives; and 3. shifts in consciousness.

[slide 8]

In the systems view, healing has to happen across personal, social, and ecological systems. As individuals, we internalize systems. We have implicit biases that affect how we perceive and interact with others, many of which are socially conditioned and unconscious. We identify with cultural norms like the imperatives for growth and self-improvement, for instance, believing that we should be as happy, successful, and productive as possible. Our ways of experiencing, relating, and orienting ourselves to the world are reflections of systems.

[slide 9]

Transforming patterns of unsustainability is therefore very deep work, requiring shifts in ourselves and societies. It can open up aspects of our identity we may prefer to leave untouched, and challenge systems we have taken for granted and internalized. It can require working with histories of trauma, abuse, neglect, feelings of isolation and disconnection. We can no longer afford to fulfill personal and social needs, for instance, by turning to addictions to drugs and alcohol, shopping, wealth, or status. We have to heal the pain at its root.

[slide 10]

In part, this will mean not just healing harm, but challenging oppressive systems like capitalism, patriarchy, militarism, colonialism, and white supremacy. In this sense, healing is not

just personal. It's also deeply social. The Atlantic slave trade, for example, coincided with the colonization of North and South America, linking racial oppression with the oppression of indigenous peoples and the ongoing occupation and destruction of their lands. Healing such a deep wound requires not just personal work, but also social and political responses, like reparations.

[slide 11]

In addition to addressing past harms, healing is also about regeneration. We must not only stop harm at its source; we must also cultivate care-based relationships and care-based systems. The concepts listed here give examples of care-based systems. Earth jurisprudence, for instance, is a way to give legal rights to nature, so the health of living systems can be protected.

In closing, take a moment to reflect on how our efforts to adapt to eco-crisis could create a more just and caring world. Every thing's wellbeing, human and nonhuman, is at stake if we don't heal. Individuals, communities, and societies need to heal past harms, and re-envision health as a collective endeavor. Few things are more important. Thank you.

A.4 Transcript: Envisioning Futures of Flourishing

[title page]

Our image of the future invariably orients us to the world. What we envision, aspire to, and anticipate structures how we understand ourselves and behave in the world. It motivates us, guides us, and also often limits us.

[slide 2]

The futures triangle, shown here, represents how the plausible future arises out of a combination of the past, present, and future. The new physics teaches that time is nonlinear. Past, present, and future exist in superposition. The future exists in the present as a latent space of possibility. The pull of the future is constrained by the weight of history and the push of the present. Everything is conditioned and impermanent, open to change and yet constrained by what is, has been, and could be.

[slide 3]

Our visions of what could be are in part informed by cultural assumptions, values, and traditions. Spiritual and religious texts, social movements, political campaigns, and works of art, for example, all communicate specific visions of a better life.

[slide 4]

Across cultures, there exist several archetypal ways to envision the future. Modern, western cultures, for example, tend to offer stories in which science, technology, and industry lead to evolutionary progress. Whereas other cultures instead assume social collapse is inevitable. Still others believe the Earth is a living system, called Gaia, and imagine humans and nonhumans co-existing in symbiotic relationship. Globalists, on the other hand, believe in a future of cosmopolitan citizens, world markets, and global governments. Finally, some people prefer to imagine the future as a return to the past, to simpler, perhaps even more primitive forms of living.

[slide 5]

Such visions are also significantly influenced by how technology shapes the future. Steampunk is a speculative fiction genre that envisions worlds where industrialization, steam-power and Victorian-era culture predominate. It is an example of a future based largely on nostalgia for the past. Atompunk, by contrast, imagines a world powered by nuclear energy and robots. It reflects the culture of the cold war era. The science fiction of the 1970's, 80's and 90's—called cassette futurism— explored worlds dominated by early information and computer technologies. Each of these visions express the cultural assumptions, values, and traditions of a particular period of time. Today, visions of the future often fall within a genre called cyberpunk. Cyberpunk extrapolates how recent cybernetic technologies, like the internet, artificial intelligence, and biotech, shapes life in a world ruled by large corporations.

[slide 6]

Climate fiction (or cli-fi) is a new sub-genre of speculative fiction presenting visions of the future impacted by climate change. Most stories in this genre portray a future civilization struggling with scarcity, inequality, and violence. The film Mad Max, for example, portrays a world of deserts and drought— a world of petroleum-based societies ruled by militaristic men competing for scarce resources. The film Snowpiercer, by contrast, depicts a frozen world in which a highly stratified class-based society survives climate change by exploiting its lower classes. While Kim Stanley Robinson's book entitled New York 2140 imagines life in New York after global sea level rise.

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These dystopian visions reflect what may happen as today's world struggles to adapt to eco-crisis. But, are these the only futures we can envision? Today's mainstream narratives depict the decline of the world much more often than they proffer positive visions of the future. As Mark Fisher writes, pop culture's propensity to imagine the end of the world rather than an alternative, serves to effectively reinforce business-as-usual.

[slide 8]

In this context, speculative fiction is extremely important because it allows us to consider the active potentials for things to be different. It encourages cognitive estrangement— meaning it estranges us from our usual assumptions about reality. It helps people imagine a plausible future, based on a combination of what is, what has been, and what could be. As the quote by Francisco Varela suggests, we can always choose to envision a future of flourishing, instead of being sold of a particular way of doing things.

[slide 9]

Many outstanding traditions of speculative fiction developed outside the mainstream provide visions of the future based on radically different cultural presuppositions, values, and traditions. The following five subgenres offer alternatives to mainstream speculative fiction: the new weird, solarpunk, indigenous futurism, afrofuturism, and sinofuturism.

[slide 10]

The New Weird is a subgenre that blends the conventions of science fiction, fantasy, and horror. The book and movie, Annihilation, by Jeff Vandermeer, for example, dissolves

distinctions between humans and the natural world, and between our inner and outer ecology, to reconsider how we live on an altered planet.

[slide 11]

Solarpunk is a sub-genre beginning online in 2008 that has grown in the last several years. It imagines positive, sustainable visions of the future. It is a rare collection of media that attempt to realistically imagine better worlds born out of eco-crisis.

[slide 12]

Indigenous futurism is an emerging sub-genre describing worlds that are decolonized, in which humans and nature live in harmony.

[slide 13]

Afrofuturism explores worlds that center black culture, thus challenging histories of white supremacy and oppression.

[slide 14]

Sinofuturism offers Chinese cultural perspectives on contemporary social and ecological issues, providing alternative ways to understand emerging potentials affecting the 21st century.

[slide 15]

Collectively, these alternative subgenres of speculative fiction critique contemporary life and offer creative possibilities for building radically different worlds. The books shown here are

examples of how such different creative movements are linked with social movements. They describe worlds organized by alternative economic systems, indigenous sovereignty, black liberation, and feminist utopias. These works inspire and motivate us to see activism as itself a form of world-building.

They present and inspire new social imaginaries—that is, new narratives that tell the story of humanity's movement toward a socially just and sustainable future based on principles of cooperation, community, and caring. An optimal response to eco-crisis is one where we imagine viable pathways toward a just transition. Envisioning futures of flourishing is one necessary skill guiding us toward that end. Thank you.

A.5 Transcript: What do we do now?

[title page]

This picture shows the anti-police brutality protestor Ieshia Evans being arrested by Baton Rouge police in 2016. It is a reminder of the clarity, conviction, and spiritual poise we need to act against oppressive systems. As we've learned in this course, the eco-crisis is a global, complex phenomenon involving many personal, social, and ecological crises. As such, responses to eco-crisis must be deep and broad, spanning the personal and political.

[slide 2]

Personally, there are several things we can do right now. Carolyn Baker outlines ten of them in Navigating the Coming Chaos: A Handbook for Inner Transition: [Number] 1. Cultivate or deepen your inner life to prepare for a chaotic and uncertain future. 2. Ally with a local group

to bring food security, energy independence, and local currency to your community. 3. Ally with trusted individuals with whom you can discuss emotional and spiritual preparation. 4. Commit to simplicity. Carefully inventory your possessions and evaluate which ones you need (and which you don't) for navigating the future. 5. Establish relationships that support your preparation, not jeopardize it. 6. Explore your emotions and deepen your communication skills. 7. Exercise daily. 8. Practice gratitude. 9. Practice kindness. 10. Create something beautiful every day to nourish your soul.

[slide 3]

Another immediate action we can take is to reduce our ecological footprint. This table ranks the impact we generate by making specific consumer choices. In addition to shopping less, we can all significantly reduce our impact by traveling less by car and plane, by using renewable energy, and by eating a plant-based diet, for example.

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Of course, these personal choices need to be part of a larger strategy for social change. There exist many social and technical solutions to sustainably transform our communities and economies. The resources shown here, which you can find referenced in the resource list for this lesson, include information on sustainable transportation, permaculture, building retrofits, green financing, renewable energy, and the circular economy, for example.

[slide 5]

These best practices are systematically implemented at the community level by the movements for transition towns, ecovillages, and solidarity economies. Each of these provide practical ways and roadmaps to sustainably re-design community life.

[slide 6]

At the global level, these practices are being implemented by a worldwide social movement of millions of people working in organizations, as documented by Paul Hawken in *Blessed Unrest*. The many alternatives that exist are also complimented by our capacity to resist and reform. The map on the right, called EJAtlas, shows documented cases of workers and indigenous activists on the frontlines of environmental justice struggles. These groups are asserting their access to resources and their right to protect the Earth. While it is essential to transform our personal behavior and social systems, it is just as necessary to challenge and remove power from the existing systems that contribute to eco-crisis.

[slide 7]

Generally, there are three logics of transformation: reform, resist, and build alternatives. All three are necessary and appropriate at different times in different contexts, depending on our power and leverage. For personal and social transformations to effectively counter hegemonic institutions, our efforts to reform, resist, and build alternatives need to be strategically contextualized and empowered by specific political programs.

[slide 8]

The following six political programs for a just transition provide different approaches to systems change: eco-socialism, eco-civilization, social anarchism, the commons, degrowth, and buen vivir. Each offer different strategic pathways to a more just and sustainable world. There is significant overlap between, for example, eco-socialism and ecological civilization, social anarchism and the commons, degrowth and buen vivir. Each of these programs have their own strengths and weakness; so it is worth examining each and combining approaches when needed.

[slide 9]

Regardless of which political program we adopt, the bottom line is: The transition to sustainability MUST be a just transition. If it isn't, then as society adapts, it will further entrench systems of inequality and injustice. Under such a scenario, adaptation to eco-crisis will serve the few, not the many. The privileged will maintain their power and wealth, diverting resources to safeguard themselves, while the masses suffer. White supremacy, patriarchy, elitism, and colonization will be legitimized as strategies for protecting the right to life of the few over the many. We are seeing indications of such a shift already underway considering the surge of right nationalism, border control, and eco-fascism as responses to eco-crisis.

[slide 10]

Ecosocialism is a political program that uses state power to challenge market power, while supporting social and ecological justice. It draws on Marxist and socialist theory to advance its political aims. The Green New Deal is an example of ecosocialism in practice.

[slide 11]

Ecological civilization is an example of ecosocialist politics in China. In 2012, the Chinese government wrote into its constitution the goal of achieving an ecological civilization. This goal was intended to systematically guide China's national development strategy, so it enforced sustainability holistically across sectors. Increasingly, eco-civilization is also spreading globally, as a way to discuss how to develop sustainable civilizational alternatives across cultural contexts.

[slide 12]

Social anarchism presents an important alternative to ecosocialism, in so far as it opposes BOTH market and state power. It favors non-hierarchical forms of networked and distributed self-governance. Social anarchists are not interested in reforming state power like ecosocialists. Instead, they prefer to organize collective power through confederated, democratically organized cooperatives. New municipalist movements like Barcelona en Comu are examples of social anarchism in practice.

[slide 13]

One of the best examples of social anarchism is the commons. The commons is a system in which communities self-organize and manage resources outside the logics of the market and state. Resources we all depend on, like water, electricity, education, and healthcare, can be collectively managed, so everyone has access to a fair share of what they need.

[slide 14]

Degrowth is a political program containing many diverse approaches within it including some already mentioned. Its basic commitment is to present alternatives to growth-based economic models. It encompasses many movements, including the deglobalization movement, free software movement, unconditional basic income movement, and food sovereignty movement.

[slide 15]

Buen Vivir is an emerging movement in Latin America that is aligned with degrowth. It provides alternatives to Western style-development based on indigenous worldviews and ways of living in relationship to nature. It was written into the constitutions of Ecuador in 2008 and in Bolivia in 2009.

[slide 16]

Given all these ways to practically implement just transitions in one's personal and political life, it is worth concluding by reflecting on one's role. It is easy to feel overwhelmed by the scale and complexity of eco-crisis and the diversity of movements that contribute to just transitions. Everyone has something to contribute, but what we contribute is always unique, based on our individual backgrounds, experiences, interests, expertise, communities and social networks.

This image shows the difference between our concerns and what we can influence. Activism is most effective when we concern ourselves with what we can influence. The more time we spend engaging issues and participating in communities we help shape, the more we engage in transformative action.

As you end this course, I encourage you to reflect on how you can advocate for eco-justice. Ask yourself: How you can commit to love yourself and others as members of the Earth community, see the intersectionality of social and eco-justice, heal planetary trauma, envision systems of flourishing, and act to implement just transitions? Thank you for your participation. I wish you the best going forward.

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